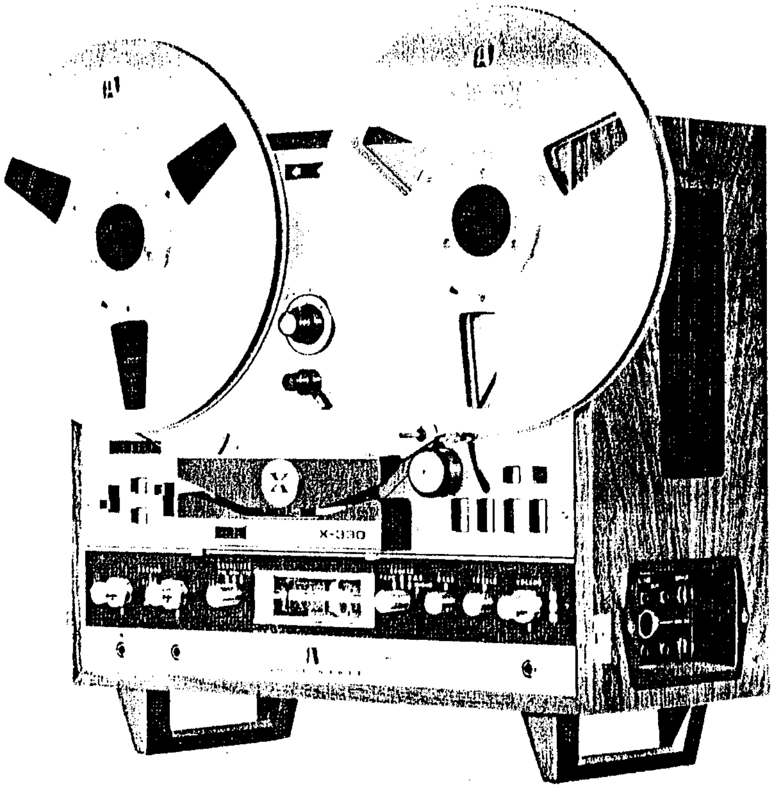
AKAI-01041

For the best performance........



AKAI
X-330

OPERATOR'S MANUAL

MULTI-PURPOSE PROGRAM MINDER TAPE RECORDER

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I . GENERAL INFORMATION

1. SPECIFICATIONS

Tape Speed : 1-7/8, 3-3/4 and 7-1/2 ips

Wow and Flutter : Less than 0.04% RMS at 7-1/2 ips
Less than 0.07% RMS at 3-3/4 ips
Less than 0.15% RMS at 1-7/8 ips

Frequency Response : STANDARD TAPE
30 to 25,000 cps ±3 db at 7-1/2 ips
30 to 18,000 cps ±3 db at 3-3/4 ips
30 to 9,000 cps ±3 db at 1-7/8 ips
LOW NOISE TAPE
30 to 26,000 cps ±3 db at 7-1/2 ips
30 to 20,000 cps ±3 db at 3-3/4 ips
30 to 13,000 cps ±3 db at 1-7/8 ips

Distortion : Within 1.5% 1,000 cps 0 VU at 7-1/2 ips

Signal to Noise Ratio : Better than 50db

Input Level : Microphone .... more than 0.5 mV
Line.................... more than 50 mV
DIN .... more than 10 mV

Power Output : 15 W maximum each channel at UNDISTORTED POWER, total 30 W
20 W maximum each channel at MUSIC POWER, total 40 W

Equalization : STANDARD TAPE or LOW NOISE TAPE
Correct equlization for playback of tapes recorded to the NARTB curve.

Recording Bias Frequency : 100 KC

Recording Level Indicator : 2 VU meters

Recording System : 4-track stereo/monaural, CROSS-FIELD bias system

Fast Forward and Rewind Time : 75 seconds using 1,200 foot tape (7" reel) at 50 cycles.
60 seconds at 60 cycles.

Head : 4 heads .... Erase, playback, record and bias heads

Motor : 3 motors .... Hysteresis synchronous 3-speed motor for capstan drive. Two 6-pole eddy current out-rotor motors for supply and take-up reel drive

Reel Size : 10-1/2", 7" and 5" reels

Speaker : 2 4"×6" speakers

Power Supply : AC 100 to 240 V, 50/60 cycles

Power Consumption : 200 W

Dimensions : 14-3/4"×17-1/8"×9-3/8" (375×436×238 mm)

Weight : 48.4 lbs (22 kg)

2. CONTROLS

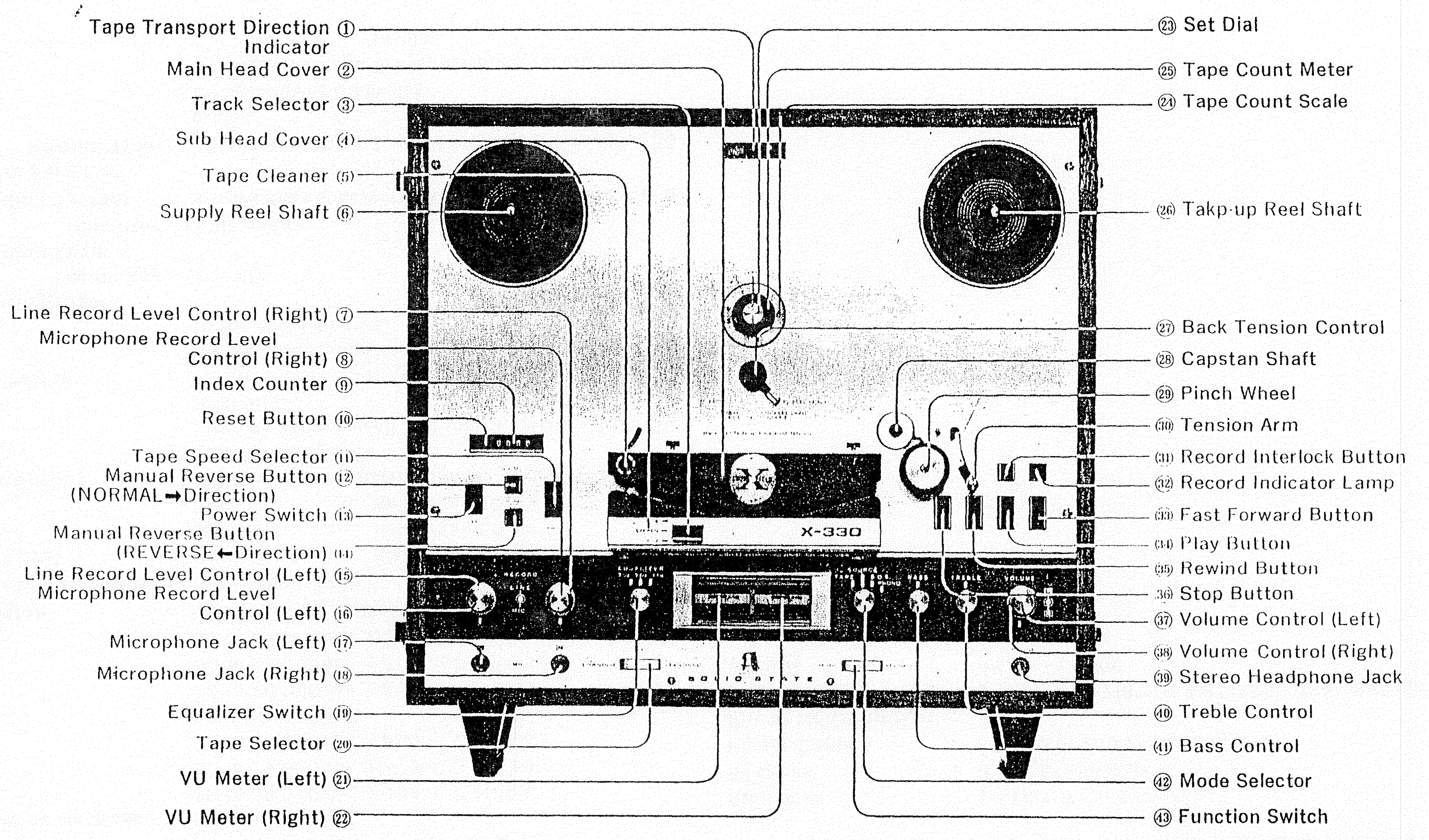
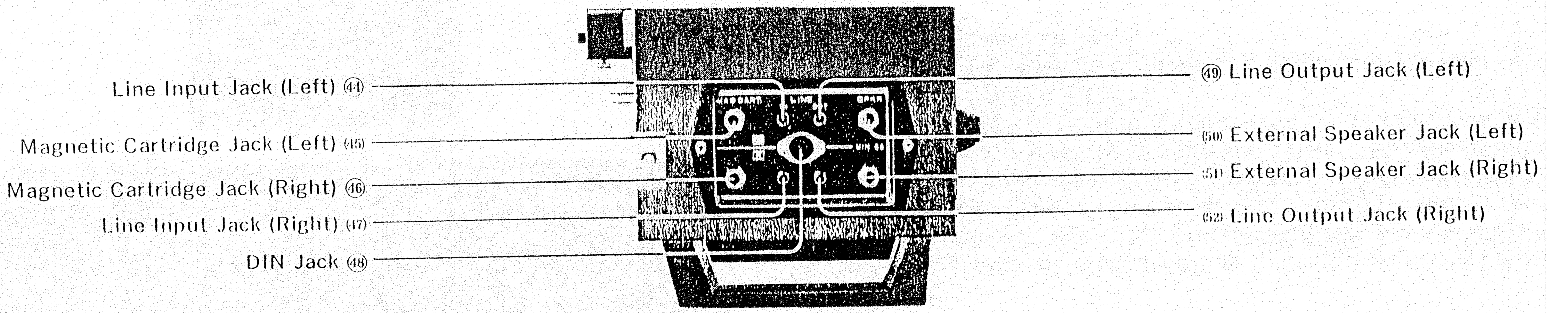
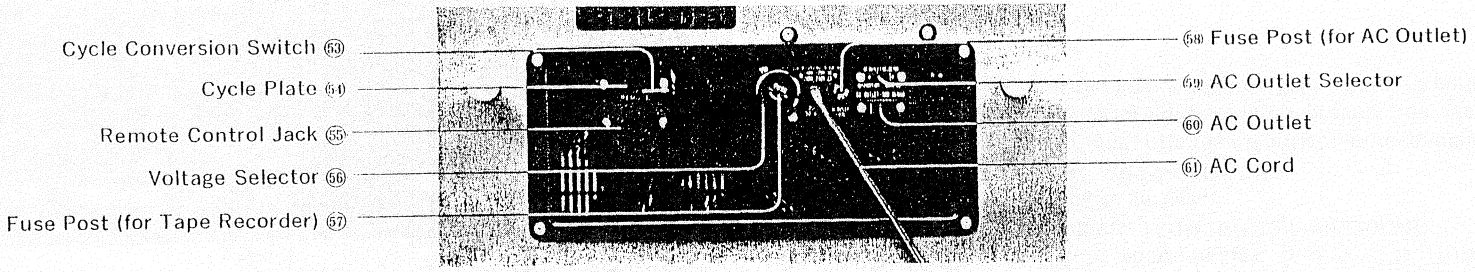

Tape Transport Direction Indicator ①
Main Head Cover ②
Track Selector ③
Sub Head Cover ④
Tape Cleaner ⑤
Supply Reel Shaft ⑥
Line Record Level Control (Right) ⑦
Microphone Record Level Control (Right) ⑧
Index Counter ⑨
Reset Button ⑩
Tape Speed Selector ⑪
Manual Reverse Button ⑫ (NORMAL→Direction)
Power Switch ⑬
Manual Reverse Button (REVERSE←Direction) ⑭
Line Record Level Control (Left) ⑮
Microphone Record Level Control (Left) ⑯
Microphone Jack (Left) ⑰
Microphone Jack (Right) ⑱
Equalizer Switch ⑲
Tape Selector ⑳
VU Meter (Left) ㉑
VU Meter (Right) ㉒
㉓ Set Dial
㉕ Tape Count Meter
㉔ Tape Count Scale
㉖ Takp-up Reel Shaft
㉗ Back Tension Control
㉘ Capstan Shaft
㉙ Pinch Wheel
㉚ Tension Arm
㉛ Record Interlock Button
㉜ Record Indicator Lamp
㉝ Fast Forward Button
㉞ Play Button
㉟ Rewind Button
㊱ Stop Button
㊲ Volume Control (Left)
㊳ Volume Control (Right)
㊴ Stereo Headphone Jack
㊵ Treble Control
㊶ Bass Control
㊷ Mode Selector
㊸ Function Switch
X-330
SOLID STATE

Fig. 1



Line Input Jack (Left) ㊹
Magnetic Cartridge Jack (Left) ㊺
Magnetic Cartridge Jack (Right) ㊻
Line Input Jack (Right) ㊼
DIN Jack ㊽
㊾ Line Output Jack (Left)
㊿ External Speaker Jack (Left)
(51) External Speaker Jack (Right)
(52) Line Output Jack (Right)

Fig. 2



Cycle Conversion Switch (53)
Cycle Plate (54)
Remote Control Jack (55)
Voltage Selector (56)
Fuse Post (for Tape Recorder) (57)
(58) Fuse Post (for AC Outlet)
(59) AC Outlet Selector
(60) AC Outlet
(61) AC Cord

Fig. 3

3. VOLTAGE AND CYCLE CONVERSION

VOLTAGE

The Model X-330 is operatable anywhere in the world. With the built-in step-down power transformer, the operator can easily readjust the recorder to any one of the six stages of power voltage from 100 to 240 volts A.C. The operator is requested to check the rear of the recorder to determine the previously set voltage before operation.

If another voltage is required, readjustment of the voltage can be made as follows.

(1) Remove the FUSE POST as shown in Fig. 4. Remove the PLUG of VOLTAGE SELECTOR and reinsert so that the desired voltage appears.

(2) The VOLTAGE SELECTOR as shown in Figs. 5, 6 and 7 is a rotable plug-in type offering six selections, 100/110/120/200/220/240.

(3) Change the fuse according to voltage.
Fuse: 100V–120V 3A, 200V–240V 2A

CAUTION: Disconnect power plug from the AC outlet before readjusting voltage. To maintain optimum performance and to prolong the life of your machine, it is important that the line voltage be held within 10 percent deviation of standard voltage.

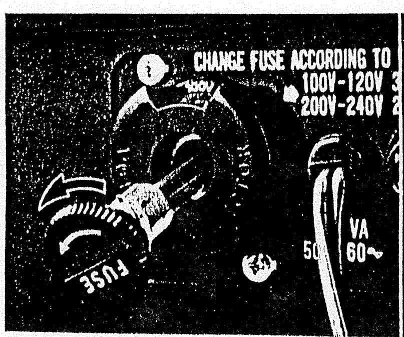

CHANGE FUSE ACCORDING TO
100V-120V
200V-240V
100V
FUSE
VA
50
60~

Fig. 4

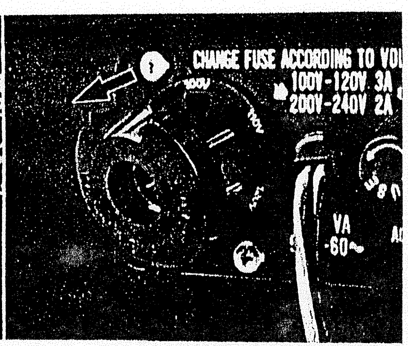

CHANGE FUSE ACCORDING TO VO
100V-120V 3A
200V-240V 2A
100V
VA
60~

Fig. 5

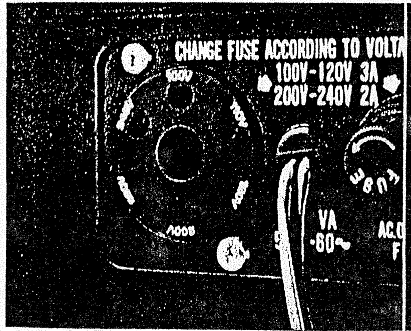

CHANGE FUSE ACCORDING TO VOLTA
100V-120V 3A
200V-240V 2A
100V
VA
60~
AC.O
F

Fig. 6

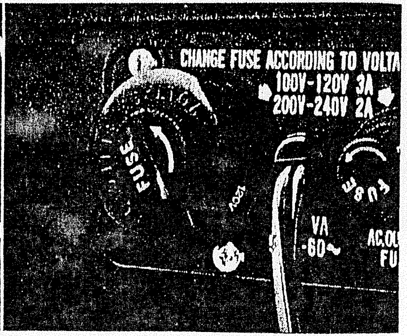

CHANGE FUSE ACCORDING TO VOLTA
100V-120V 3A
200V-240V 2A
FUSE
VA
60~
AC.OU
FU

Fig. 7

CYCLE

Correct tape speed cannot be obtained if the CYCLE CONVERSION SWITCH is not properly positioned. The CYCLE CONVERSION SWITCH is located in the rear of the recorder. Using a screw driver, loosen the SCREWS [(a) and (b)]. 50 cycle operation is obtained by setting the CYCLE CONVERSION SWITCH to left side and the CYCLE PLATE to "SET FOR 50 Hz". 60 cycle operation is obtained by setting CYCLE CONVERSION SWITCH to right side and the CYCLE PLATE to "SET FOR 60 Hz".

CAUTION: Do not attempt to rotate the CYCLE CONVERSION SWITCH when the motor is not running.

50 Hz

60 Hz

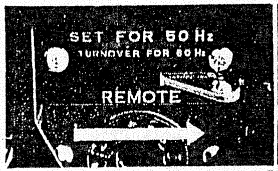

SET FOR 50 Hz
TURNOVER FOR 60 Hz
REMOTE

Fig. 8

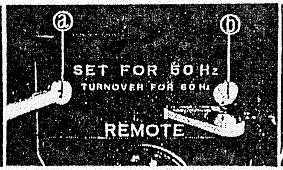

ⓐ
ⓑ
SET FOR 60 Hz
TURNOVER FOR 60 Hz
REMOTE

Fig. 9

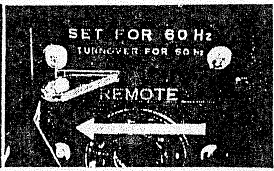

SET FOR 60 Hz
TURNOVER FOR 50 Hz
REMOTE

Fig. 11

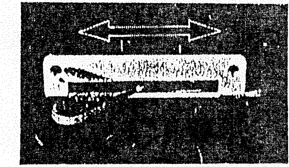


Fig. 10

1-7/8 ips

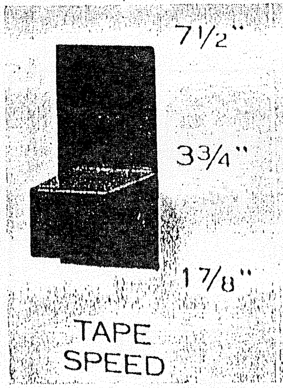


Fig. 12

3-3/4 ips

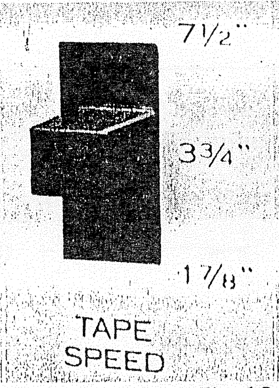


Fig. 13

7-1/2 ips

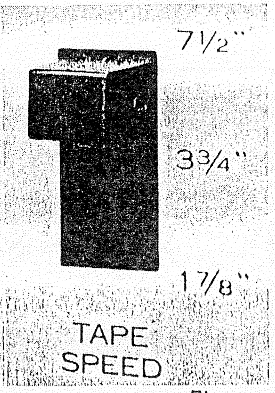


Fig. 14

4. TAPE SPEED SELECTION

The X-330 operates on 3 tape speeds, 7-1/2, 3-3/4 and 1-7/8 ips.

1-7/8 ips.	This tape speed is obtained by setting the TAPE SPEED SELECTOR to "1-7/8".
3-3/4 ips.	This tape speed is obtained by setting the TAPE SPEED SELECTOR to "3-3/4".
7-1/2 ips.	This tape speed is obtained by setting the TAPE SPEED SELECTOR to "7-1/2".

RECORDING TIME

4-TRACK STEREO			
TAPE LENGTH	TAPE SPEED		
	1-7/8ips	3-3/4	7-1/2
1200ft	4hrs	2	1
1800	6	3	1.5
2400	8	4	2
3600	12	6	3
4800	16	8	4
7200	24	12	6
4-TRACK MONO			
1200	8	4	2
1800	12	6	3
2400	16	8	4
3600	24	12	6
4800	32	16	8
7200	48	24	12

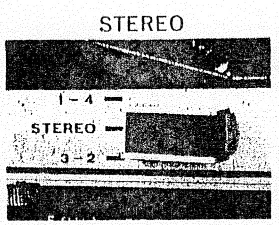

STEREO
1-4
STEREO
3-2

Fig. 15

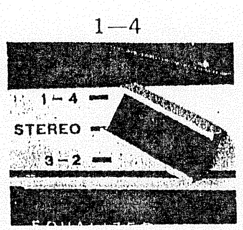

1—4
1-4
STEREO
3-2

Fig. 16

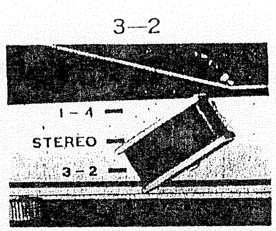
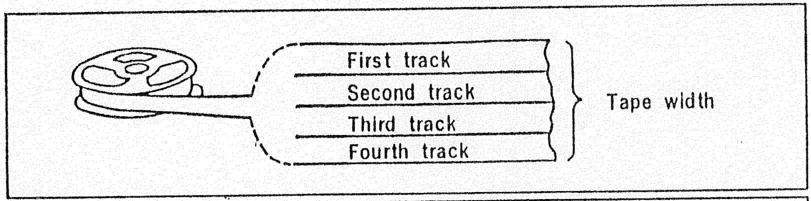
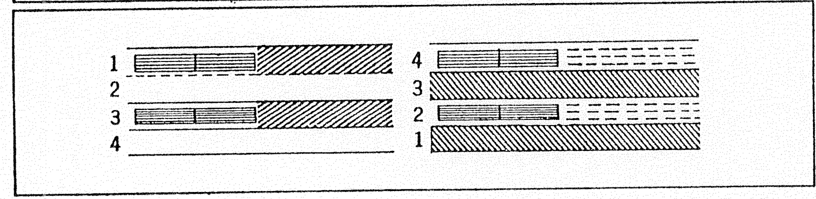
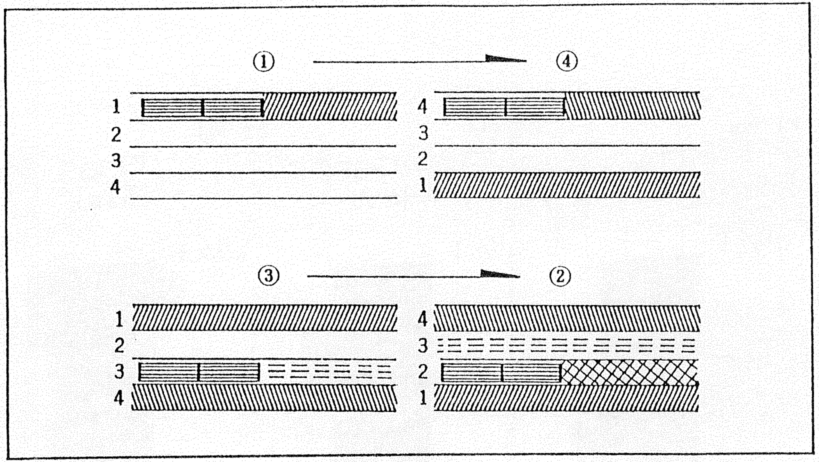

3—2
1-4
STEREO
3-2

Fig. 17


First track
Second track
Third track
Fourth track
Tape width




①
④
1
2
3
4
4
3
2
1
③
②
1
2
3
4
4
3
2
1

5. 4-TRACK RECORDING/PLAYBACK SYSTEM

The X-330 employs a four track system which can be used for either stereo or monaural recording/playback. The desired track or tracks are selected by the TRACK SELECTOR.

4-TRACK STEREO RECORDING/PLAYBACK

Stereo recording/playback requires the simultaneous use of two tracks.
Set the TRACK SELECTOR to "STEREO".

The first stereo recording/playback occurs on tracks 1 and 3, and the second on tracks 2 and 4 after the reels have been inverted.

4-TRACK MONAURAL RECORDING/PLAYBACK

Monaural recording/playback track sequence should be 1-4-3-2.

(A) Set the TRACK SELECTOR to "1-4". The frist monaural recording/playback occurs on track 1, and the second on track 4 after the reels have been inverted.

(B) Invert the reels.

(C) Set the TRACK SELECTOR to "3-2".
The third monaural recording/playback occurs on track 3, and the fourth on track 2 after the reels have been inverted.

The X-330 does not record in the reverse direction. Using reverse playback, it is not necessary to turn the tape reels over. When the X-330 begins reverse playback, the playback head automatically shifted to the remaining tracks.

Diagram 1. Ordinary recording system

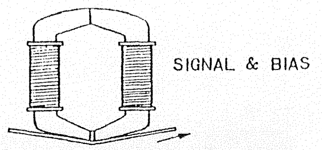
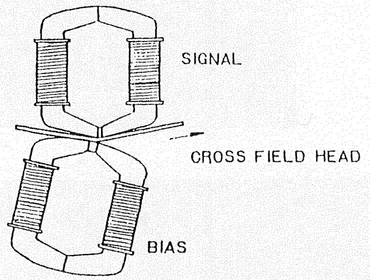


Diagram 2. Cross-field recording system



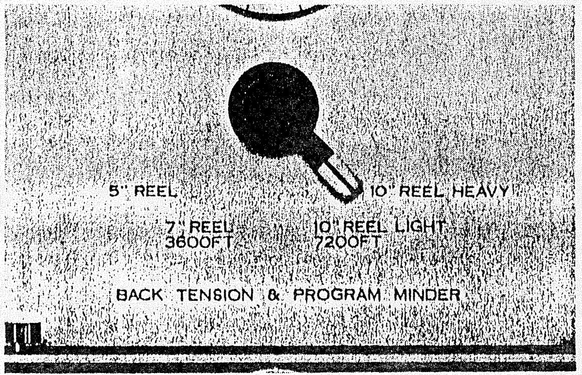
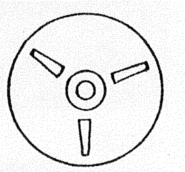
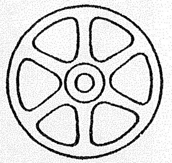


Fig. 18



Heavy weight



Light weight

6. CROSS-FIELD HEAD

AKAI's exclusive cross-field head has created a sensation in the tape recorder world by offering a wide recording range which has never been duplicated. Using this cross-field head, Model X-330 provides a surprising recording performance (30 to 25,000 cps ±3 db at a tape speed of 7-1/2 ips.).

Why is cross-field recording superior? How does it differ from conventional recording methods? In the typical recording system, the signal current and the bias current are combined and applied to the recording head. (Diagram 1). It is well known that the bias current is applied to the recording head to minimize distortion while maintaining a proper sensitivity ratio.

However, the bias current providing such an advantage also has an undesirable effect. That is, the wide magnetic field of the bias current affects the recorded signal, resulting in the weakening or even erasing of the signal. The phenomenon is particularly noticeable at high frequencies.

In the cross-field system, the signal current is applied to the recording head while the bias current is applied to the bias head.

These two heads are positioned as determined inter-relatively, so that the magnetic field of the bias will not affect the signal recorded on the tape, even when maximum bias is applied. This permits recording with high fidelity even at low speeds.

7. MAGNETIC BRAKE

Conventional type tape recorders often employ a rubber braking system. This system however is inefficient and is a source of trouble due to parts wear.

Akai's magnetic braking system was developed in order to eliminate these weak points and has successfully utilized electrical force and rubber auxiliaries for instant stop. This adjustable brake effectively controls tape tension, eliminating loose or stretched tapes.

NOTE: Set BACK TENSION CONTROL to "10" REEL HEAVY", "10" REEL LIGHT", "7" REEL" or "5" REEL" as required. In this case, set TAPE COUNT METER to "OFF".

REEL SIZE	BACK TENSION CONTROL
10" (Heavy weight)	10" REEL HEAVY
10" (Light weight)	10" REEL LIGHT
7"	7" REEL
5"	5" REEL

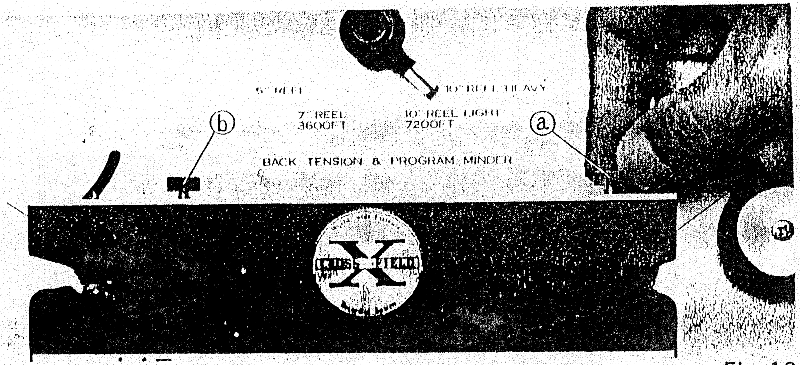

5" REEL
10" REEL HEAVY
ⓑ
7" REEL
3600FT
10" REEL LIGHT
7200FT
ⓐ
BACK TENSION & PROGRAM MINDER

Fig. 19

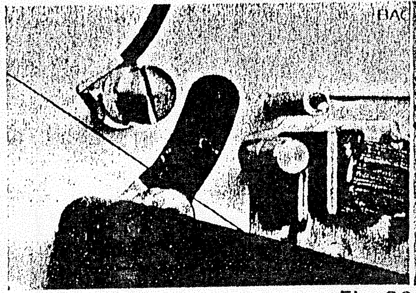


Fig. 20

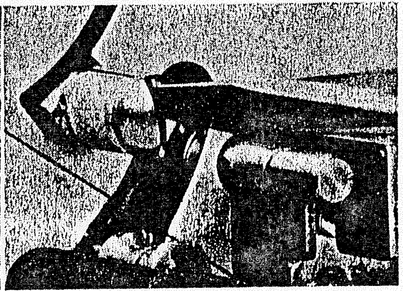


Fig. 21

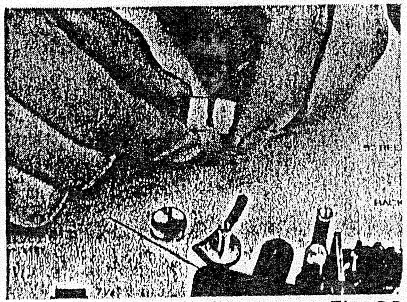


Fig. 22

8. TAPE CLEANER

A squeaking noise may annoy the operator during recording/playback. This may be caused by either poor tape or ambient conditions of temparature and humidity. When foreign material adheres to the tape it piles up on the recording head affecting volume and sound quality the high frequency range. The model X-330 is equipped with a TAPE CLEANER Fig. 20, a felt pad properly soaked with silicon oil, to aid in noise elimination and facilitate tape cleaning. When the felt pad is contaminated on one side it may rotated by loosening the holding screw. In this case, loosen the SCREWS (a and b) and remove the HEAD COVER (Fig. 19). Replacement may be made when both sides are contaminated.

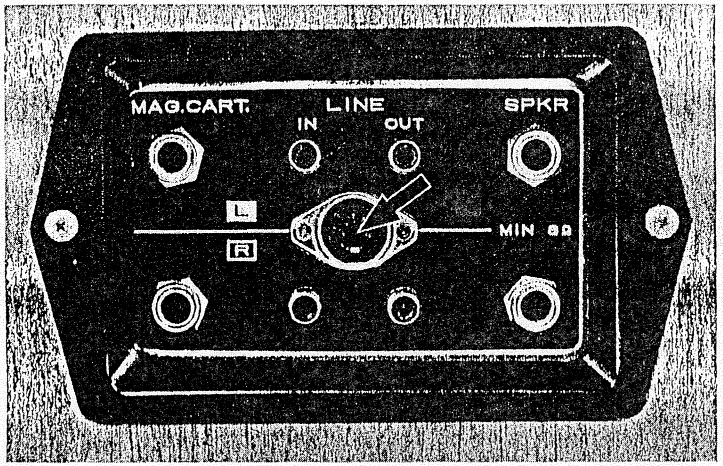
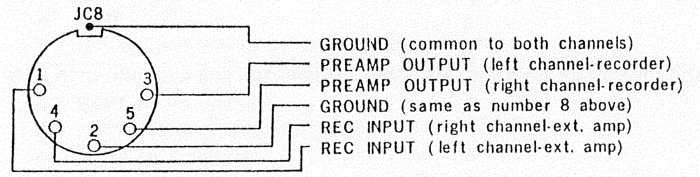

MAG.CART.
LINE
IN
OUT
SPKR
L
R
MIN 8Ω

Fig. 23


JC8
1
3
4
5
2
GROUND (common to both channels)
PREAMP OUTPUT (left channel-recorder)
PREAMP OUTPUT (right channel-recorder)
GROUND (same as number 8 above)
REC INPUT (right channel-ext. amp)
REC INPUT (left channel-ext. amp)

9. DIN (ONE MULTIPLE-CONNECTION) JACK

The DIN JACK which is provided at the right side of Model X-330, and is used for interconnecting Model X-330 with an external stereo amplifier, has a compatible connection jack. This system permits easy recording and playback of stereo programs through an external stereo amplifier. Thus the complex connection or disconnection of more than 4 separate plugs from Model X-330's panel side is avoided.

If your amplifier is not equipped with the DIN jack and the use of this one connection system is required, AKAI DR-110 may be used.

10. OPERATING PRECAUTIONS

IMPORTANT: READ THE FOLLOWING INSTRUCTIONS CAREFULLY BEFORE OPERATING YOUR MACHINE:

① THE USE OF NEW TAPE WILL RESULT IN THE BEST RECORDINGS.

② THE SYMPTOMS LISTED BELOW DO NOT NECESSARILY INDICATE MECHANICAL FAILURE OF YOUR TAPE RECORDER.
IF YOUR MACHINE EXHIBITS ANY OF THESE SYMPTOMS, CHECK FOR THE TROUBLE AS INDICATED.

(1) Loss of sensitivity and tone quality may be due to:
   - A. Dirty erase head. This will prevent prerecorded material from being completely erased.
   - B. Dust on the recording head. Clean the head gently with a soft cotton swab soaked in rubbing alcohol or carbon tetrachloride.
   - C. A.C. power voltage lower than the standard voltage to which your machine is adjusted.

(2) Irregularity in the transport may be due to:
   - A. Grime adhering to the heads.
   - B. Oil on the capstan.
   - C. Sticky or dirty tape surface.
   - D. Bent take-up reel.

(3) If your machine will not record, check the following for correct position.
   - A. Record interlock button and play button.
   - B. Input plugs.

(4) If your machine will not playback, check the following for correct position.
   - A. Mode selector.

NOTE:

(1) Before operating your machine, be sure to clean the surface of the head.

(2) Unused tape may become soft and sticky. It is advisable to run the tape once from the supply reel to the take-up reel before threading it for recording.

③ THE FOLLOWING NOTES ARE PROVIDED FOR YOUR CONVENIENCE.

(1) If any trouble develops, please take your machine to the nearest authorized agent in your area or inquire at the Service Dept. of the Akai Company in Tokyo, Japan.

(2) Your Akai Model X-330 requires constant voltage for optimum performance.

(3) The standard 1,200 foot length of tape on a 7" reel plays up to 32 minutes at 7-1/2 ips speed in one direction.

(4) If the sound sources are so far away from the microphones that the volume control must be turned up to a maximum, some hum or noise will inevitably be recorded. In such instance, a test recording is recommended before attempting a final recording.

Ⅱ.OPERATING INSTRUCTIONS

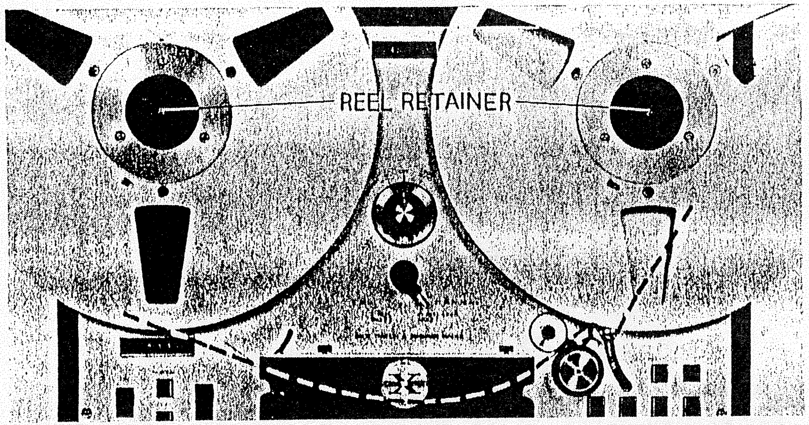


Fig. 24

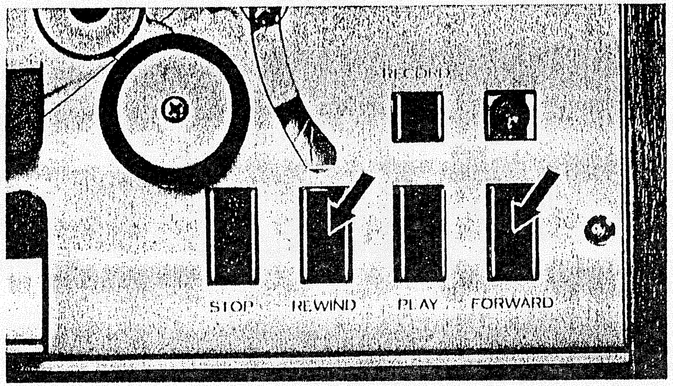


Fig. 25

1. TAPE LOADING

Place the full reel of tape on the SUPPLY REEL SHAFT and the empty reel on the TAKE-UP REEL SHAFT.
Thread the tape as illustrated by the dotted line in Fig. 24.
When the recorder is used in the vertical (recommended) position, lock the reels with the retainers provided on the top of REEL SHAFTS.
CAUTION : Thread the tape below the TENSION ARM.

2. FAST FORWARD AND REWIND

To use fast-forward or rewind, push the FAST FORWARD BUTTON or the REWIND BUTTON.
Only the STOP BUTTON should be used to stop fast-forward or rewind.

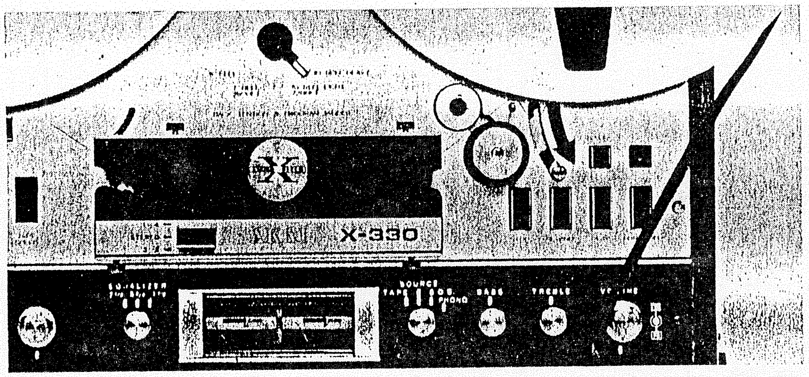


Fig. 26

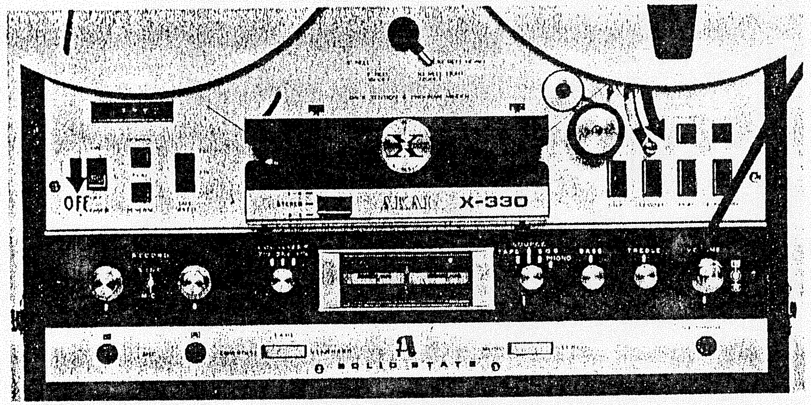


Fig. 27

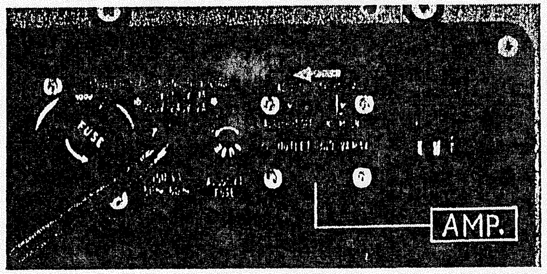


Fig. 28

3. AUTOMATIC STOP (DECK ONLY)

One of the features of Model X-330 is the function of the automatic stop unit. When the tape ends or is accidently broken the TENSION ARM drops and the PINCH WHEEL is automatically released from the CAPSTAN SHAFT and reel movement stops.

4. AUTOMATIC SHUT-OFF (DECK AND AMPLIFIERS)

To obtain automatic shut-off of the recorder, set the POWER SWITCH to "OFF" after pushing the PLAY, FAST FORWARD or REWIND BUTTON and starting the tape. If the tape ends or is accidently broken, the TENSION ARM drops and the deck and amplifiers will be turn off automatically.

NOTE :

At that time, if the external amplifier is connected to AC OUTLET of Model X-330, the external amplifier will be turned off automatically also. In this case, set the AC OUTLET SELECTOR of Model X-330 to "AUTO SHUT-OFF".

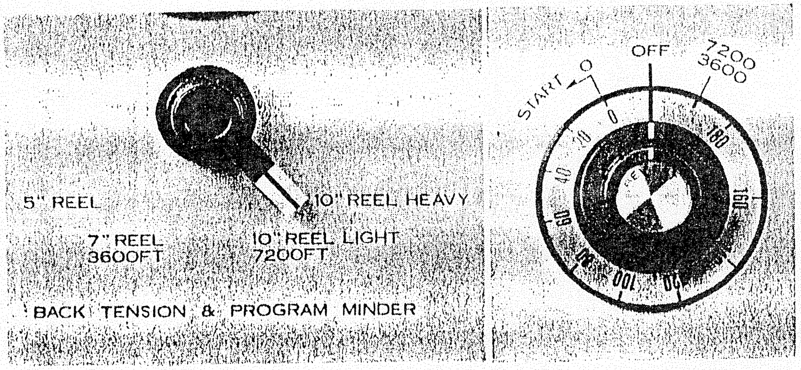

5" REEL
7" REEL
3600FT
10" REEL HEAVY
10" REEL LIGHT
7200FT
BACK TENSION & PROGRAM MINDER
START
O
OFF
7200
3600
0
20
40
60
80
100
120
160
180

Fig. 29

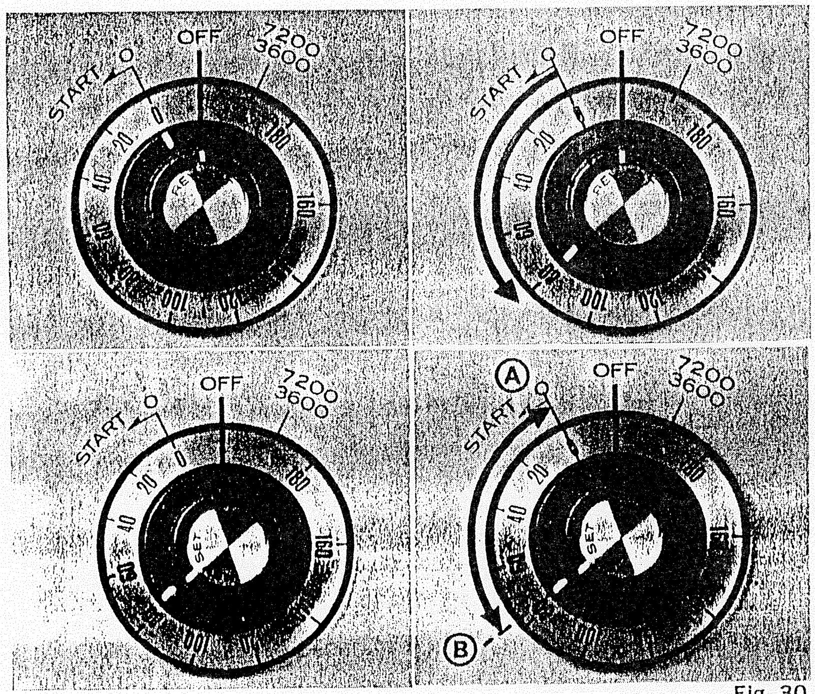

START
O
OFF
7200
3600
0
20
40
60
80
100
120
160
180
SET
Ⓐ
Ⓑ

Fig. 30

5. AUTOMATIC REVERSE (PROGRAM MINDER)

Automatic reverse is used for playback only. When the PROGRAM MINDER is used for automatic reverse the X-330 will give continuous playback in both directions between any two points (A and B) selected on the tape.

(A) Set BACK TENSION CONTROL to "10" REEL HEAVY", "10" REEL LIGHT" "7" REEL" or "5" REEL" as required. In this case, set TAPE COUNT METER to "OFF".

(B) Align TAPE COUNT METER with the "O" on TAPE COUNT SCALE. This step establishes point A on the tape. In this case, set SET DIAL to "OFF" on TAPE COUNT SCALE.

(C) Advance the tape by either PLAY BUTTON or FAST FORWARD BUTTON. As the tape feeds forward, TAPE COUNT METER moves counter clockwise shown in Figure 30.
Push STOP BUTTON when the tape has advanced to the desired point B.

(D) Rotate SET DIAL until its mark is aligned with the mark on TAPE COUNT METER (point B) as shown in Figure 30.

(E) Using the REWIND BUTTON or MANUAL REVERSE BUTTON (REVERSE← DIRECTION), rewind the tape back to the starting point A.
As the tape rewinds or playback in reverse, TAPE COUNT METER moves clockwise.
The starting point A is reached when the mark of TAPE COUNT METER is aligned with the "O" on TAPE COUNT SCALE.

(F) Push PLAY BUTTON or MANUAL REVERSE BUTTON (NORMAL→DIRECTION).
The X-330 will now playback from point A to point B, and upon reaching point B will reverse itself and playback to point A where it will reverse itself again for playback to point B. This operation will continue automatically, as shown in Figure 30, until STOP BUTTON is pushed.
When PLAY BUTTON is pushed again, playback will resume in the forward direction until reversal occurs at point B.

NOTE (1):
In step (C), if PLAY BUTTON is used to advance the tape, it is not necessary to push STOP BUTTON at point B. Approaching the desired point B, perform steps (D). In step (C), rotate SET DIAL counter clockwise until its mark has slightly passed the mark of TAPE COUNT METER. The X-330 will begin reverse play as soon as the mark of TAPE COUNT METER aligns itself with the mark on SET DIAL. Steps (E) and (F) are not necessary, however, the information contained there following is applicable.

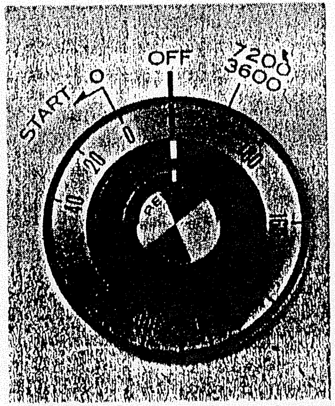


Fig. 31

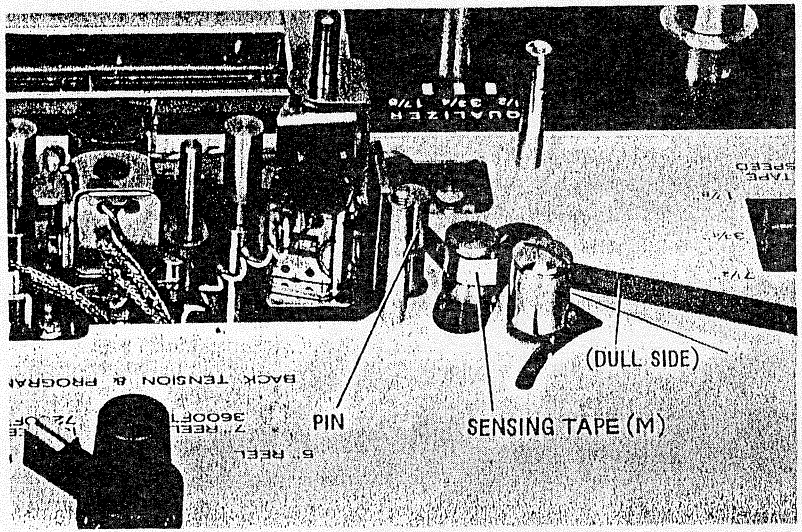


Fig. 32

NOTE (2):
Using 7" reel, 3600 foot is the maximum length of tape that can be reversed using TAPE COUNT METER. But using 10-½" reel, 7200 foot is the maximunn length. The intervals between numbers is determined by reel size and tape speed.

6. AUTOMATIC REVERSE (METALLIC SENSING TAPE)

Automatic reverse with metallic sensing tape is used for playback only.

(A)Set TAPE COUNT METER and SET DIAL to "OFF" on TAPE COUNT SCALE.

(B) Cut sensing tape approximately 1/2 inches.

(C) Put this sensing tape at the desired reverse point of the tape in use. Reversal will occur when the metallic sensing tape makes contact with SENSING PIN.

(D) If you put sensing tape at the desired reverse point M on dull side of the tape in use, the tape direction (→) will automatically reverse and play in the opposite direction (←).

(E) If you put metallic sensing tape at the desired reverse point N on shiny side of the tape in use, the tape direction (←) will automatically reverse and play in the opposite direction (→).

(F) So, if you put two pieces of metallic sensing tape at the desired points M and N simultaneously, the X-330 will give continuous playback in both direction between M and N.

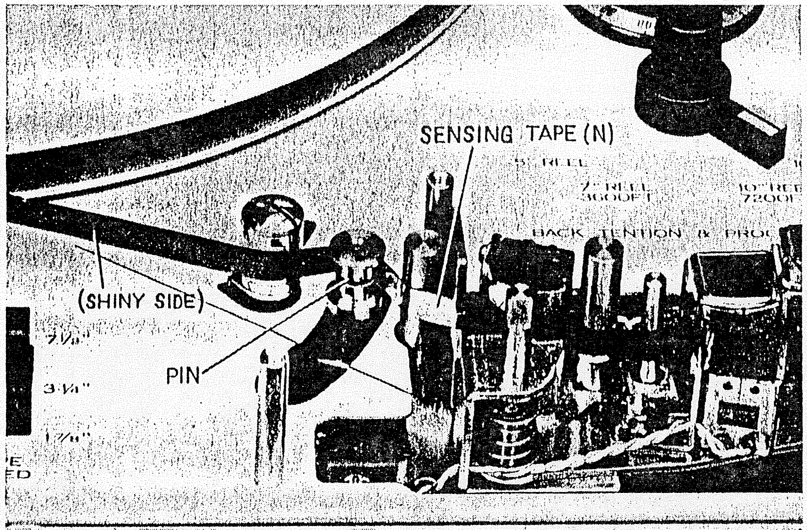
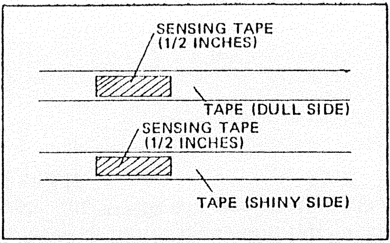
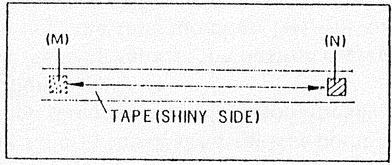

SENSING TAPE (N)
5" REEL
7" REEL 3600FT
10" REEL 7200FT
BACK TENSION & PROG
(SHINY SIDE)
PIN
7½"
3¾"
1⅞"

Fig. 33


SENSING TAPE (1/2 INCHES)
TAPE (DULL SIDE)
SENSING TAPE (1/2 INCHES)
TAPE (SHINY SIDE)

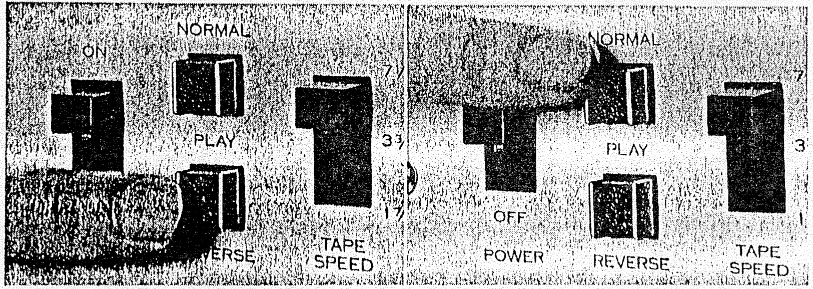

(M)
(N)
TAPE (SHINY SIDE)

CAUTIONS :

(1) If sensing tape is dirty, the proper reverse operation of the tape will not be made. Therefore, wipe the surface without fail with dry and clean cloth after binding.

(2)

REVERSE MODE	POWER SWITCH	TAPE PLAY
"PROGRAM MINDER"	"ON"	CONTINUOUS REVERSE PLAY (↔)
	"OFF" SHUT OFF	ONE NORMAL (→) AND REVERSE (←) PLAY
"SENSING TAPE"	"ON"	CONTINUOUS REVERSE (↔)
	"OFF" SHUT OFF	ONE NORMAL (→) AND REVERSE (←) PLAY


ON
NORMAL
PLAY
ERSE
TAPE SPEED
7½
3¾
1⅞
OFF
POWER
NORMAL
PLAY
REVERSE
TAPE SPEED
7
3

(1) (2) Fig. 34

7. MANUAL REVERSE

Pushing MANUAL REVERSE BUTTONS will put the X-330D into the reverse (playback) function anytime. When it is required to turn the forwarding tape (➡) to the reverse direction (⬅), push the MANUAL REVERSE BUTTON (REVERSE ⬅ DIRECTION) and when turning the reversing tape (⬅) to the forward direction (➡), push the MANUAL REVERSE BUTTON (NORMAL ➡ DIRECTION).

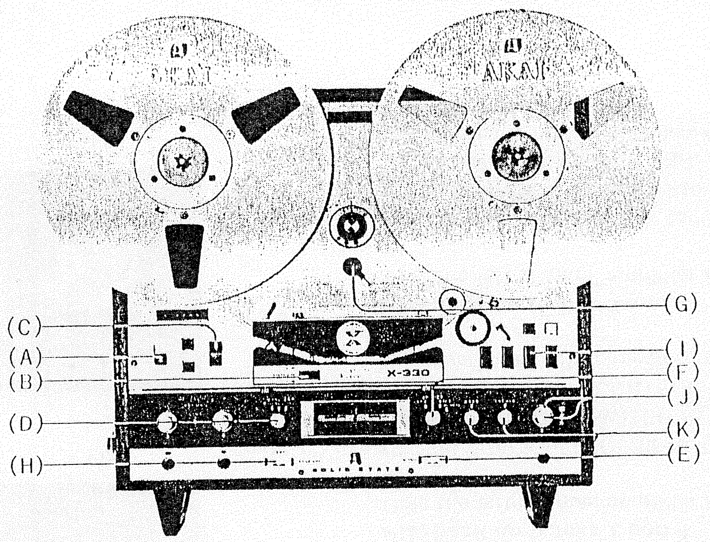
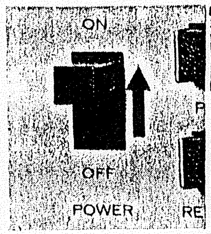
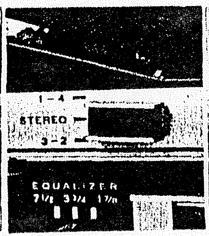

AKAI
(C)
(A)
(B)
(D)
(H)
(G)
(I)
(F)
(J)
(K)
(E)
X-330
SOLID STATE

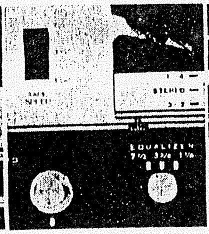
Fig. 35


ON
OFF
POWER
RE

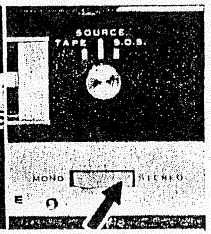
(A)


1-4
STEREO
3-2
EQUALIZER
7½ 3¾ 1⅞

(B)


1-4
STEREO
3-2
EQUALIZER
7½ 3¾ 1⅞

(C)(D)


SOURCE
TAPE
S.O.S.
MONO
STEREO
E

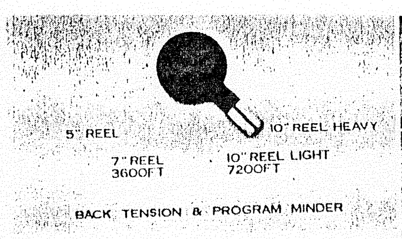
(E)(F)

8. PLAYBACK

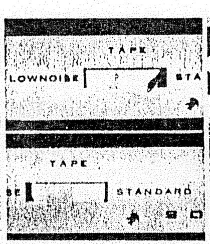
STEREO

Connect the recorder to AC power source with the attached AC CORD and load the tape.

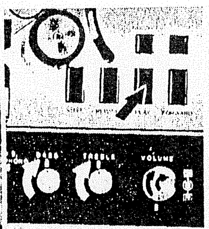
(A) Set POWER SWITCH to "ON".
(B) Set TRACK SELECTOR to "STEREO".
(C) Set TAPE SPEED SELECTOR to "7-1/2", "3-3/4" or "1-7/8" as desired.
(D) Set EQUALIZER SWITCH to "7-1/2", "3-3/4" or "1-7/8", whichever is consistent with tape speed.
(E) Set FUNCTION SWITCH to "STEREO".
(F) Set MODE SWITCH to "TAPE".


5" REEL
10" REEL HEAVY
7" REEL
3600FT
10" REEL LIGHT
7200FT
BACK TENSION & PROGRAM MINDER

(G)


TAPE
LOWNOISE
STA
TAPE
STANDARD

(H)


BASS
TREBLE
VOLUME

(I)(J)(K)

(G) Set BACK TENSION CONTROL to "10" REEL HEAVY", "10" REEL LIGHT", "7" REEL" or "5" REEL" as required.

(H) For playback, it is possible to set TAPE SELECTOR to either "LOW NOISE" or "STANDARD".

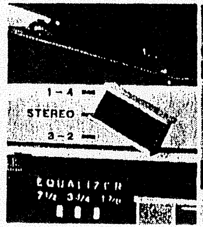
(I) After the above operation, push PLAY BUTTON to start playback.

(J) Adjust VOLUME CONTROLS (LEFT and RIGHT) to desired volume.

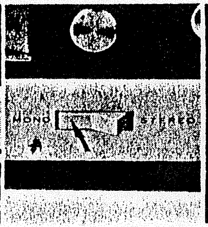
(K) Adjust BASS CONTROL and TREBLE CONTROL to desired tone.
If you would like stress bass sound, turn BASS CONTROL clockwise, and if treble sound, turn TREBLE CONTROL clockwise.

NOTE:
If automatic reverse is required, set your machine to "REVERSE MODE" as instructed in pages 13~16.

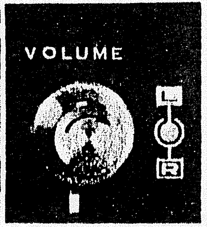
REVERSE MODE	POWER SWITCH	TAPE PLAY
"PROGRAM MINDER"	"ON"	CONTINUOUS REVERSE PLAY (↔)
	"OFF" (SHUT-OFF)	ONE NORMAL (→) AND REVERSE (←) PLAY
"SENSING TAPE"	"ON"	CONTINUOUS REVERSE PLAY (↔)
	"OFF" (SHUT-OFF)	ONE NORMAL (→) AND REVERSE (←) PLAY


1-4
STEREO
3-2
EQUALIZER
7½ 3¾ 1⅞

(B)


MONO
STEREO

(E)



(J)

MONAURAL

For monaural playback, substitute the following steps (B), (E) and (J) of the stereo procedure, and add step (L). Follow the rest of the stereo procedure.

Playback on tracks 1 and 4

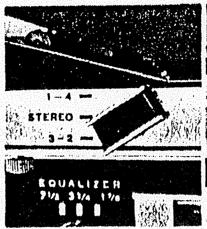
Only the left channel amplifier is used for monaural playback on tracks 1 and 4.

(B) Set TRACK SELECTOR to "1-4".

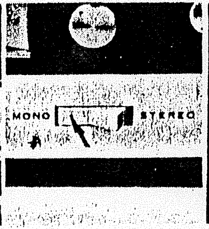
(E) Set FUNCTION SWITCH to "MONO".

(J) Adjust VOLUME CONTROL to desired volume.

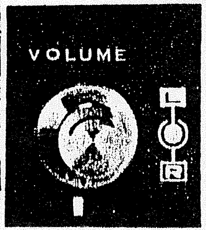
(L) Invert the reel to playback on track 4.


1-4
STEREO
3-2
EQUALIZER
7½ 3¾ 1⅞

(B)


MONO
STEREO

(E)



(J)

Playback on tracks 3 and 2

Only the left channel amplifier is used for monaural playback on tracks 3 and 2.

(B) Set TRACK SELECTOR to "3-2".

(E) Set FUNCTION SWITCH to "MONO".

(J) Adjust VOLUME CONTROL to desired volume.

(L) Invert the reel to playback on track 2.

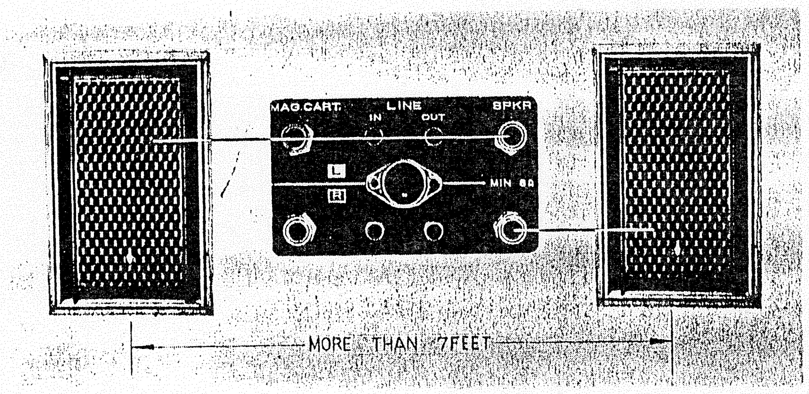

MAG.CART.
LINE
IN
OUT
SPKR
L
R
MIN 8Ω
MORE THAN 7FEET

Fig. 36

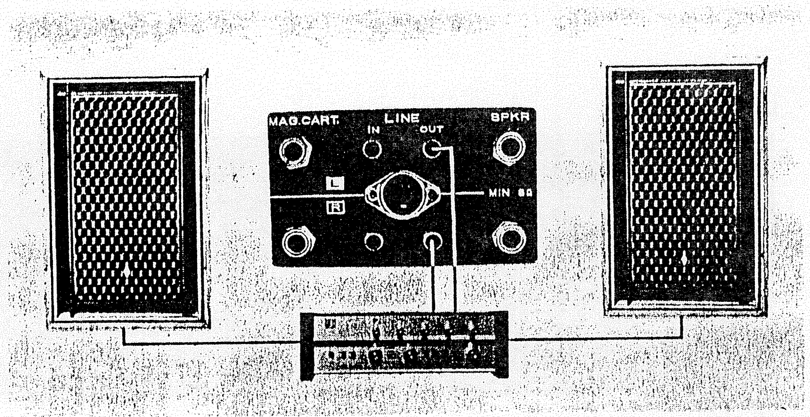

MAG.CART.
LINE
IN
OUT
SPKR
L
R
MIN 8Ω

Fig. 37

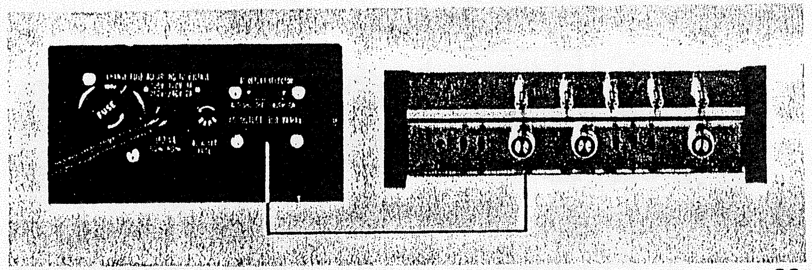


Fig. 38

USING EXTERNAL SPEAKERS & EXTERNAL AMPLIFIER AND SPEAKERS

SPEAKERS

Insert the plugs from the external speakers into EXTERNAL SPEAKER JACKS (LEFT and RIGHT) of the X-330. The external speakers should be separated by at least seven feet.

AMPLIFIER & SPEAKERS

Connect LINE OUTPUT JACKS (LEFT and RIGHT) of the X-330 to AUX jacks (LEFT and RIGHT) of the external amplifier. And insert the plugs from the external speakers into speaker output jacks or speaker output terminals (LEFT and RIGHT) of the external amplifier.

NOTE :

AC OUTLET of the X-330·········	Power supply for the external amplifier or record player. This power supply provides up to 300VA.

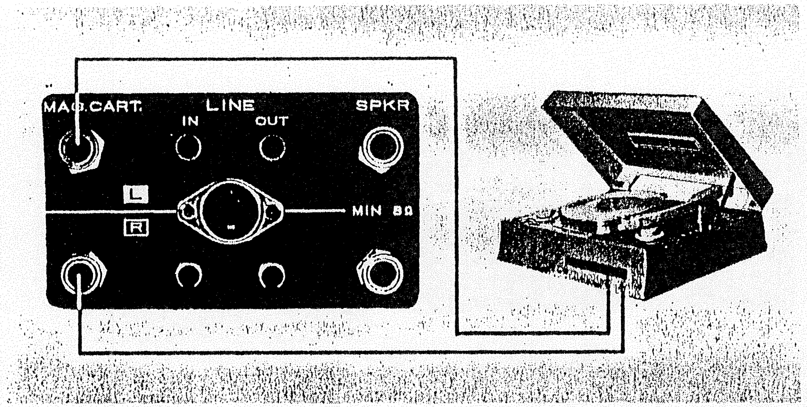
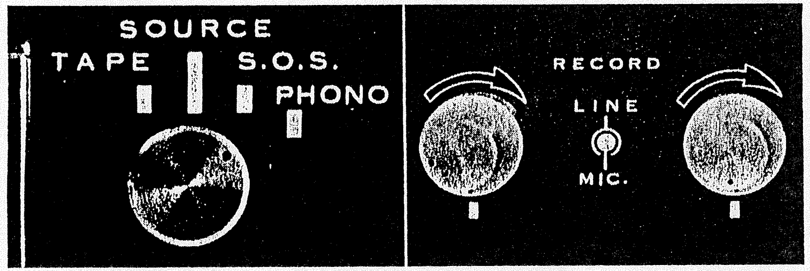

MAG.CART.
LINE
IN
OUT
SPKR
L
R
MIN 8Ω

Fig. 39


SOURCE
TAPE
S.O.S.
PHONO
RECORD
LINE
MIC.

(1) (2) Fig. 40

CONNECTION WITH RECORD PLAYER

If you connect the X-330 to your record player with magnetic cartridge, you enjoy to play HiFi stereo discs.

(A) Connect MAGNETIC CARTRIDGE JACKS (LEFT and RIGHT) of the X-330 to the record player with magnetic cartridge.
(B) Set MODE SELECTOR to "PHONO".
(C) Adjust LINE RECORD LEVEL CONTROLS (LEFT and RIGHT) to proper level, while observing VU METERS (LEFT and RIGHT).
(D) Adjust VOLUME CONTROLS (LEFT and RIGHT) to desired volume.
(E) Using the external speakers, insert the plugs from the external speakers into EXTERNAL SPEAKER JACKS (LEFT and RIGHT) of the X-330.

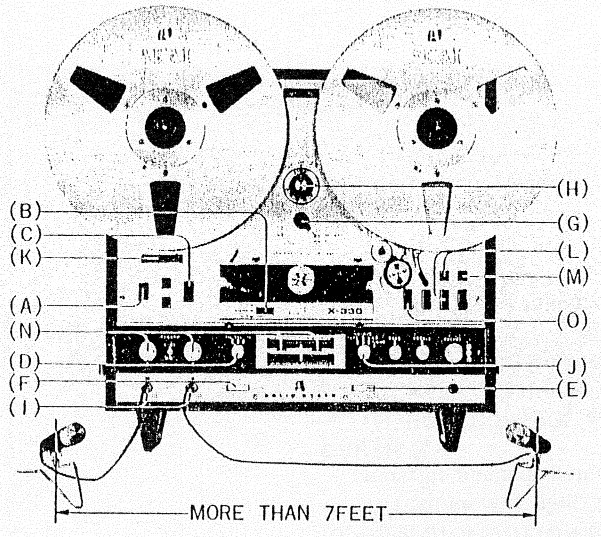
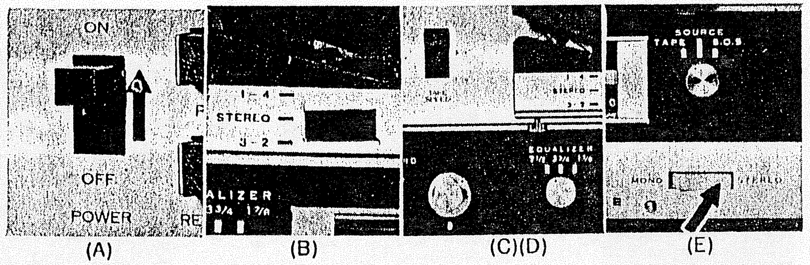

(B)
(C)
(K)
(A)
(N)
(D)
(F)
(I)
(H)
(G)
(L)
(M)
(O)
(J)
(E)
X-330
MORE THAN 7FEET

Fig. 41

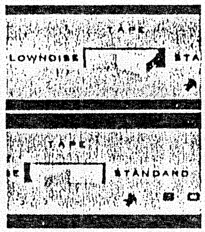

ON
OFF
POWER
1-4
STEREO
3-2
ALIZER
3 3/4 1 7/8
EQUALIZER
7 1/2 3 3/4 1 7/8
SOURCE
TAPE
S.O.S
MONO
STEREO
(A)
(B)
(C)(D)
(E)

9. RECORDING

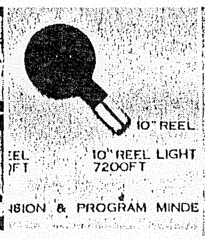
STEREO

Connect the recorder to AC power source with the attached AC CORD and load the tape.

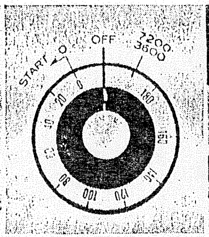
(A) Set POWER SWITCH to "ON".
(B) Set TRACK SELECTOR to "STEREO".
(C) Set TAPE SPEED SELECTOR to "7-1/2", "3-3/4" or "1-7/8" as desired.
(D) Set EQUALIZER SWITCH to "7-1/2", "3-3/4" or "1-7/8", whichever is consistent with tape speed.
(E) Set FUNCTION SWITCH to "STEREO".



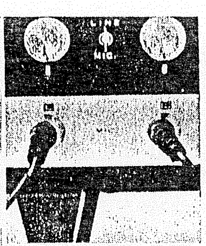
(F)



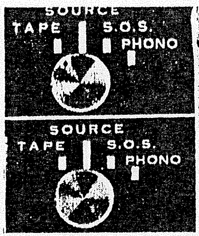
(G)



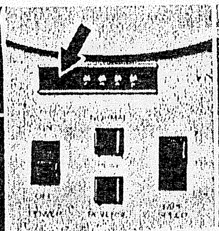
(H)



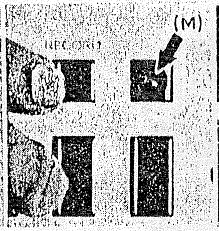
(I)



(J)



(K)



(L)(M)

RECORD
LINE
MIC

(N)

(F) Set TAPE SELECTOR to "LOWNOISE" or "STANDARD" as required.
Low noise tape························"LOWNOISE"
The other tape························"STANDARD"

(G) Set BACK TENSION CONTROL to "10" REELHEAVY", "10" REEL LIGHT", "7" REEL" or "5" REEL" as required.

(H) During recording, set TAPE COUNT METER to "OFF".

(I) After the above operation, insert the microphone plugs into MICROPHONE JACKS (LEFT and RIGHT).
Maintain a distance of at least seven feet between the microphones.

(J) Set MODE SELECTOR to either "TAPE" or "SOURCE".
When set to "TAPE", the recorded signal is reproduced immediately after the recording. When set to "SOURCE", the program being recorded may be monitored. Monitor sound volume is adjusted by VOLUME CONTROLS (LEFT and RIGHT).

(K) Push RESET BUTTON and set INDEX COUNTER to "0000".
This INDEX COUNTER provides a reference for locating any position on the tape.

(L) Push PLAY BUTTON while pushing RECORD INTERLOCK BUTTON to start recording.

(M) Check that RECORD INDICATOR LAMP is on.
If the lamp is not on, the X-330 will not record.

(N) Microphone volume level may be adjusted and balanced by MICROPHONE RECORD LEVEL CONTROLS (LEFT and RIGHT). Normal recording should not exceed the black zone on VU METERS (LEFT and RIGHT).

(O) Push STOP BUTTON to stop recording.
To resume recording, RECORD INTERLOCK BUTTON and PLAY BUTTON must be pushed again.

CAUTION :

(1) BASS CONTROL and TREBLE CONTROL have no effect on recording quality. But monitor sound is controlled by them.

(2) If the microphones are used near the recorder, acoustic feedback may result. To avoid this, decrease VOLUME CONTROLS (LEFT and RIGHT) to minimum. In this case, monitor is performed by stereo headphones.

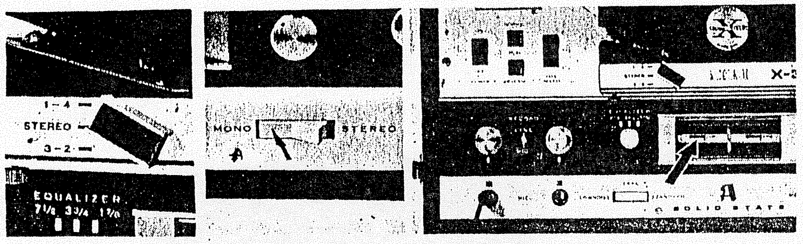
MONAURAL

Only the left channel amplifier is used for monaural recording.

For monaral recording, substitute the following steps (B), (E), (I) and (N) of the stereo procedure, and add step (P). Follow the rest of the stereo procedure.

Recording on tracks 1 and 4

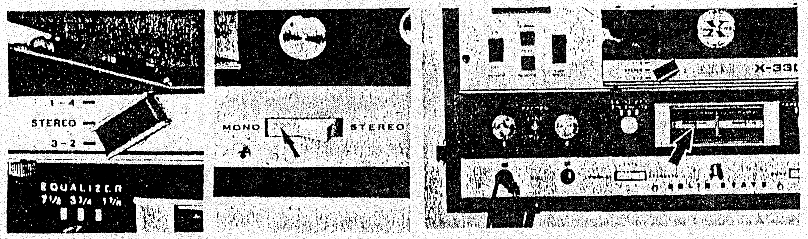
(B) Set TRACK SELECTOR to "1-4".
(E) Set FUNCTION SWITCH to "MONO".
(I) Insert microphone plug into MICROPHONE JACK (LEFT).
(N) Microphone volume level may be adjusted and balanced by MICROPHONE RECORD LEVEL CONTROL (LEFT), while observing VU METER (LEFT).
(P) Invert the reel to record on track 4.


1-4
STEREO
3-2
EQUALIZER
7½ 3¾ 1⅞
MONO
STEREO
X-3
SOLID STATE

(B) (E) (I)(N)

Recording on tracks 3 and 2

(B) Set TRACK SELECTOR to "3-2".
(E) Set FUNCTION SWITCH to "MONO".
(I) Insert microphone plug into MICROPHONE JACK (LEFT).
(N) Microphone volume level may be adjusted and balanced by MICROPHONE RECORD LEVEL CONTROL (LEFT), while observing VU METER (LEFT).
(P) Invert the reel to record on track 2.


1-4
STEREO
3-2
EQUALIZER
7½ 3¾ 1⅞
MONO
STEREO
X-330
SOLID STATE

(B) (E) (I)(N)

FROM AN EXTERNAL AMPLIFIER

If an external amplifier or tuner-amplifier combination is used, connect TAPE OUTPUT leads of the external amplifier to LINE INPUT JACKS (LEFT and RIGHT) in step (I) of the recording procedure. VU level is controlled with LINE RECORD LEVEL CONTROLS (LEFT and RIGHT). The X-330 will record any source that can be selected on the external amplifier.

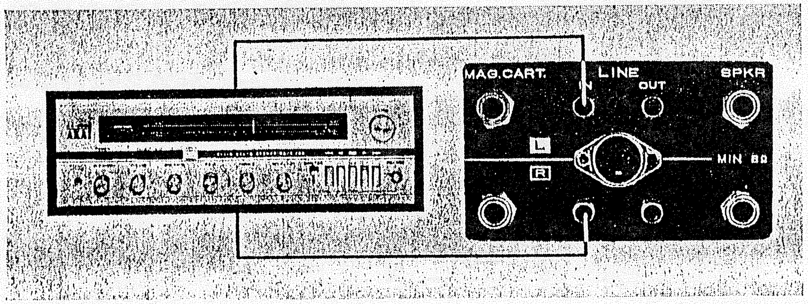

MAG.CART.
LINE
IN
OUT
SPKR
L
R
MIN 8Ω

Fig. 42

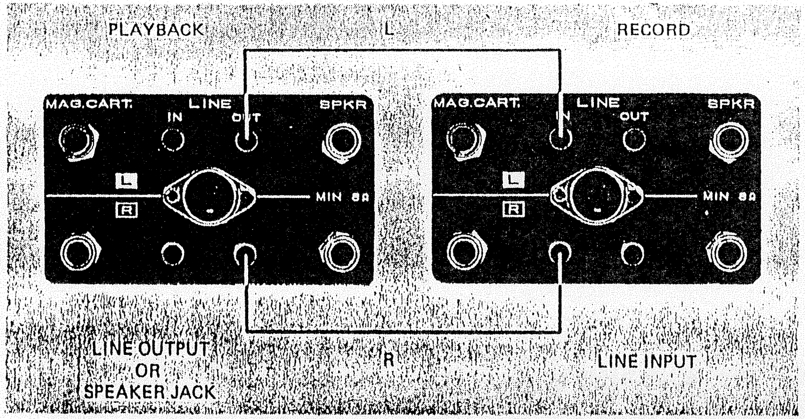

PLAYBACK
L
RECORD
MAG.CART.
LINE
IN
OUT
SPKR
L
R
MIN 8Ω
MAG.CART.
LINE
IN
OUT
SPKR
L
R
MIN 8Ω
LINE OUTPUT
OR
SPEAKER JACK
R
LINE INPUT

Fig. 43

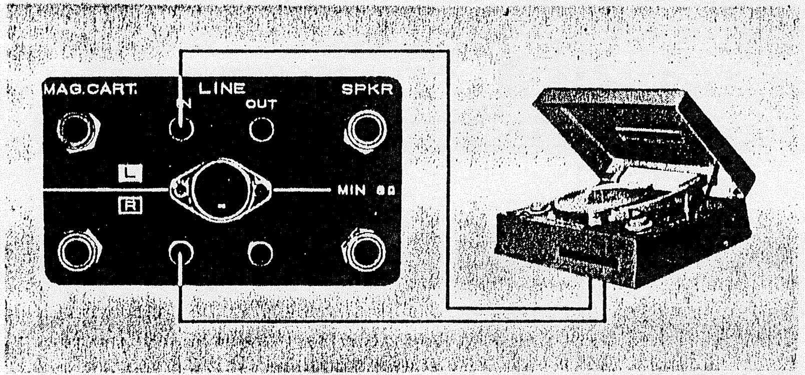

MAG.CART.
LINE
IN
OUT
SPKR
L
R
MIN 8Ω

Fig. 44

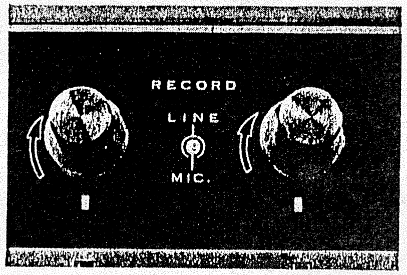

RECORD
LINE
MIC.

Fig. 45

FROM ANOTHER TAPE RECORDER

Connect LINE OUTPUT JACKS or EXTERNAL SPEAKER JACKS of the playback machine to LINE INPUT JACKS of the record machine in step (I) of the the recording procedure. VU level is controlled with LINE RECORD LEVEL CONTROLS (LEFT and RIGHT).

FROM DISCS

CRYSTAL PICK UP or CERAMIC PICK UP

(A) Connect the record player with crystal pick up or ceramic pick up to LINE INPUT JACKS (LEFT and RIGHT) in step (I) of the recording procedure.
(B) VU level is controlled with LINE RECORD LEVEL CONTROLS (LEFT and RIGHT).
(C) Follow the rest of the recording procedure.

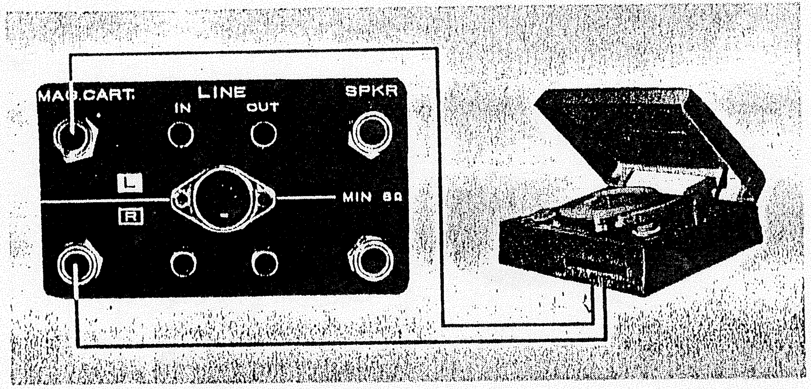

MAG.CART.
LINE
IN
OUT
SPKR
L
R
MIN 8Ω

Fig. 46

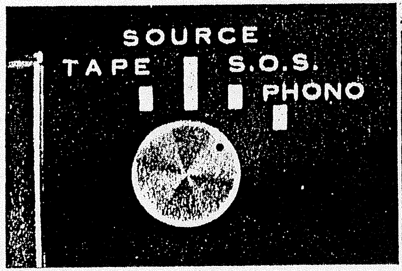

SOURCE
TAPE
S.O.S.
PHONO

Fig. 47

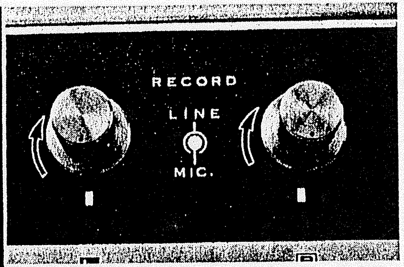

RECORD
LINE
MIC.

Fig. 43

MAGNETIC CARTRIDGE

(A) Connect the record player with magnetic cartridge to MAGNETIC CARTRIDGE JACKS (LEFT and RIGHT) of the recording procedure.

(B) Set MODE SELECTOR to "PHONO" in step (J) of the recording procedure.

(C) VU level is controlled with LINE RECORD LEVEL CONTROLS (LEFT and RIGHT) in step (N) of the recording procedure.

(D) Follow the rest of the recording procedure. Monitor sound volume is adjusted by VOLUME CONTROLS (LEFT and RIGHT).

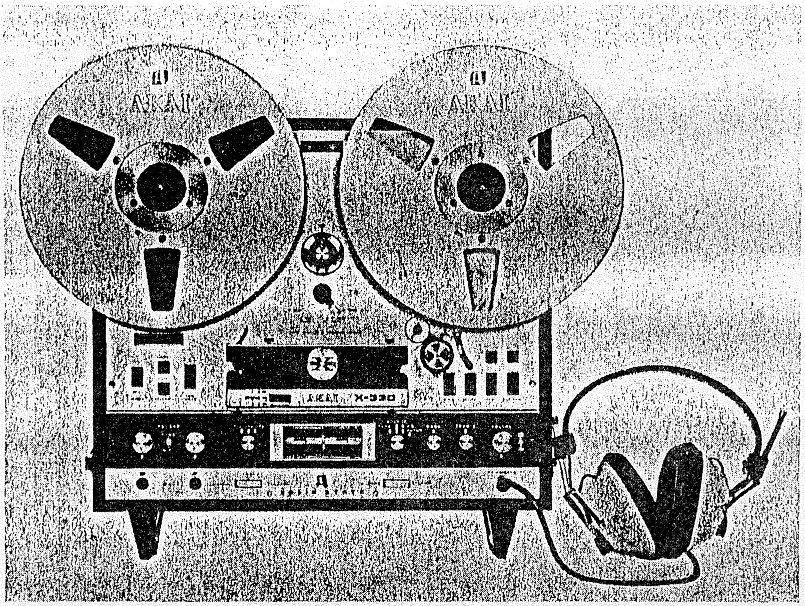


Fig. 49

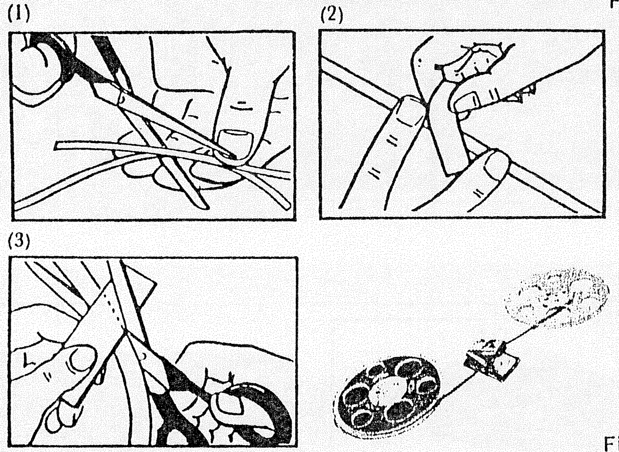


Fig. 50

10. MONITORING

Step (J) of the recording procedure describes monitoring.
If the stereo headphone is used for monitoring, connect it to STEREO HEADPHONE JACK.
CAUTION: The stereo headphones should be of low impedance type (8 ohms).

11. TAPE SPLICING AND EDITING

Superimpose the tapes and cut them diagonally as illustrated in Figures. Cutting on the diagonal eliminates the "click" or "pop" sound in recording/playback.
Match the aligned ends and apply splicing tape to the glossy side.
Firmly press the splice with fingers to secure the ends evenly. Trim off excess splicing tape (cut into the recording tape very slightly as illustrated by the dotted lines—this eliminates the possibility of a sticky splice.) Because tape splicing with scissors is difficult and requires much skill, it is recommended that our specially designed portable splicer be used to ensure professional results.
NOTE: When double or triple play tape is used, high quality splicing tape (e. g. SCOTCH 620-1/2) is recommended.

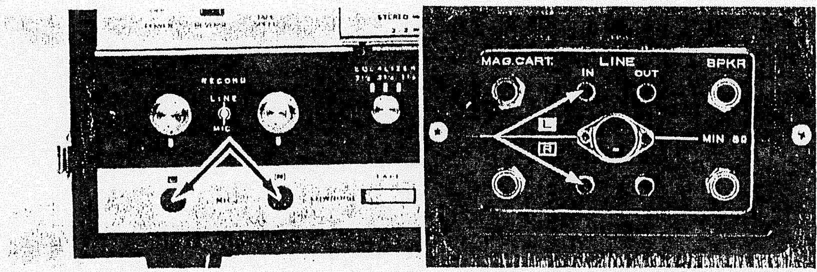
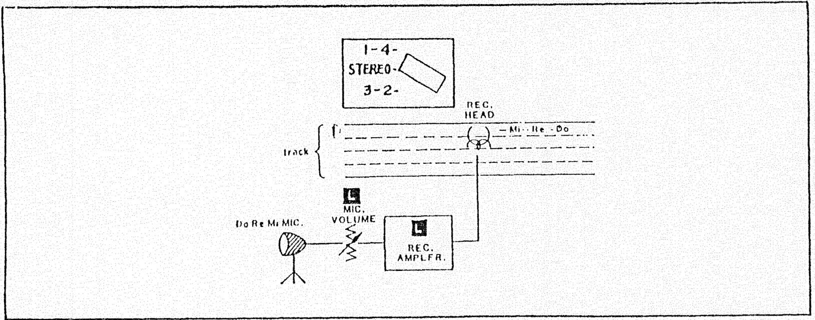


Fig. 51



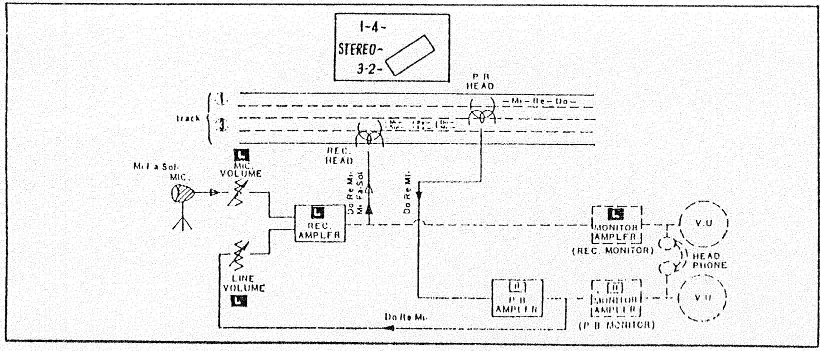
12. TAPE ERASING

Any signal information previously recorded on the tape will be automatically erased before and as the new recording occurs. Load the tape and set the recorder to the normal record position. No plugs should be connected to the LINE INPUT JACKS and the MICROPHONE JACKS. A Bulk Tape Eraser should be used for quick and complete erasing.

13. SOUND ON SOUND

First Recording

(A) Set POWER SWITCH to "ON".
(B) Set TRACK SELECTOR to "1-4".
(C) Select the desired tape speed by TAPE SPEED SELECTOR.
(D) Set EQUALIZER SWITCH to "7-1/2", "3-3/4" or "1-7/8", whichever is consistent with tape speed.
(E) Set FUNCTION SWITCH to "STEREO".
(F) Set TAPE SELECTOR to "LOWNOISE" or "STANDARD" as required.
(G) Set BACK TENSION CONTROL to "10" REEL HEAVY", "10" REEL LIGHT", "7" REEL" or "5" REEL" as required.
(H) Insert the microphone plug into MICROPHONE JACK (LEFT).
(I) Set MODE SELECTOR to "TAPE" or "SOURCE".
(J) Push RESET BUTTON and set INDEX COUNTER to "0000".
(K) Push PLAY BUTTON while pushing RECORD INTERLOCK BUTTON for making the first recording, i.e. Do-Re-Mi.
(L) Adjust MICROPHONE RECORD LEVEL CONTROL (LEFT) to the proper level on VU METER (LEFT).
(M) Decrease VOLUME CONTROLS (LEFT and RIGHT) to minimum.
(N) When the first recording is complete, rewind the tape by REWIND BUTTON to the start position.


1-4-
STEREO-
3-2-
P B
HEAD
track
1
3
– Mi – Re – Do –
REC.
HEAD
Mi Fa Sol
MIC.
L
MIC.
VOLUME
Do Re Mi
Mi Fa Sol
Do Re Mi
L
REC.
AMPLFR
L
MONITOR
AMPLFR
(REC. MONITOR)
V.U
HEAD
PHONE
LINE
VOLUME
L
R
P B
AMPLFR
R
MONITOR
AMPLFR
(P B MONITOR)
V.U
Do Re Mi

Second Recording

(A) Set MODE SELECTOR to "S.O.S.".

(B) Set TRACK SELECTOR to "3-2".

(C) Increase LINE RECORD LEVEL CONTROL (LEFT) to maximum.

(D) Connect the stereo headphones to STEREO HEADPHONE JACK for monitoring the first recording.

(E) Push PLAY BUTTON while pushing RECORD INTERLOCK BUTTON.
The first recording will be heard through the headphones.

(F) Reset LINE RECORD LEVEL CONTROL (LEFT) to the proper level by watching VU METER (LEFT).

(G) After the reset, rewind the tape again by REWIND BUTTON to start position.
Push PLAY BUTTON while pushing RECORD INTERLOCK BUTTON.
The second recording, Mi-Fa-Sol, is made on track 3 as the first recording, Do-Re-Mi, is monitored in the headphones. The two will be completely merged on track 3, i.e., (Do-Mi-Re-Fa-Mi-Sol).

(H) The third and subsequent recordings are made the same as the second by switching "1-4", "3-2" of TRACK SELECTOR.

14. SOUND WITH SOUND

To record sound with sound, substitute the following step for step (C) of the sound on sound second recording procedure and eliminate step (F) of second recording.

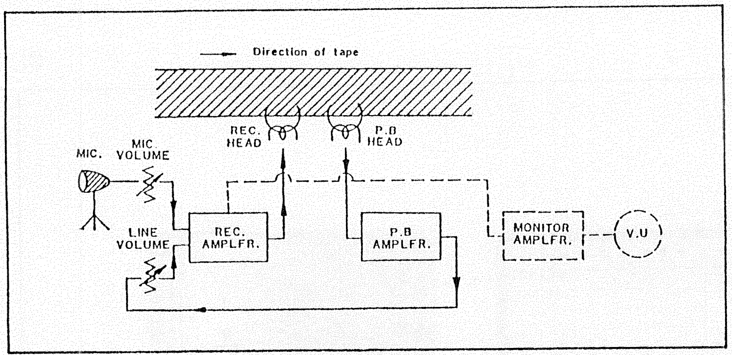
(C) Decrease LINE RECORD LEVEL CONTROL (LEFT) to minimum.

15. SOUND OVER SOUND

Sound over sound recording is a mixing recording.

(A) Connect the plug of the microphone to MICROPHONE JACK and the output terminal of external amplifier or record player to LINE INPUT JACK.

(B) Microphone volume level may be adjusted by MICROPHONE RECORD LEVEL CONTROL, and line volume level by LINE RECORD LEVEL CONTROL.


Direction of tape
MIC.
MIC VOLUME
REC. HEAD
P.B HEAD
LINE VOLUME
REC. AMPLFR.
P.B AMPLFR.
MONITOR AMPLFR.
V.U

16. REVERBERATION

Reverberation recording can be made monaurally or in stereo.

- (A) Decrease VOLUME CONTROLS (LEFT and RIGHT) to minimum.
- (B) Set MODE SELECTOR to "PHONO".
- (C) Insert the plugs of the microphones into MICROPHONE JACKS (LEFT and RIGHT).
- (D) Adjust MICROPHONE RECORD LEVEL CONTROLS (LEFT and RIGHT) to the proper level on VU METERS.
- (E) The reverberation level may be controlled by LINE RECORD LEVEL CONTROLS (LEFT and RIGHT).
- (F) Monitoring is performed by connecting stereo headphones to STEREO HEADPHONE JACK.

17. HEAD CLEANING

Tape Oxide/Dust Deposits Cause 90% of Your Tape Recording Failure

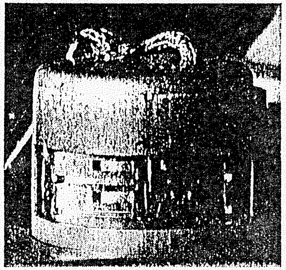
For quality performance it is imperative that tape recorder heads be kept neat and clean at all times.

Dust and magnetic particles from the tape tend to deposit on the heads after prolonged use of the recorder. This results in poor head-to-tape contact deteriorating sound quality and sensitivity. Worse still such dust causes drastic drops in recording/playback levels and nullifies high quality sound.

EXAMPLE

CLEAN HEAD

Frequency response curve



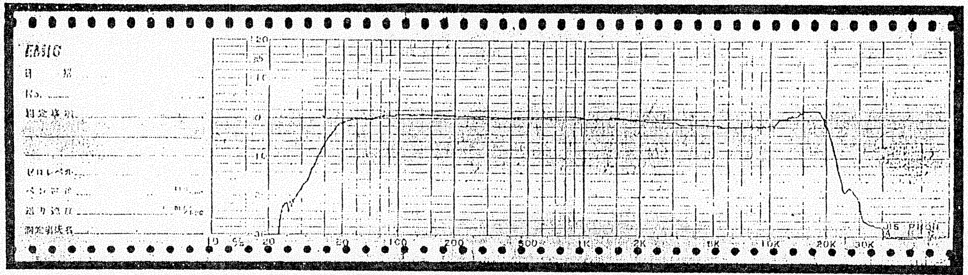
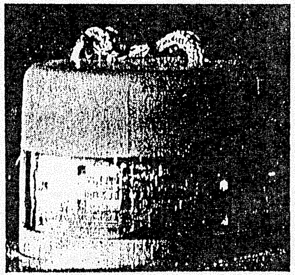


Fig. 52

DUSTY HEAD



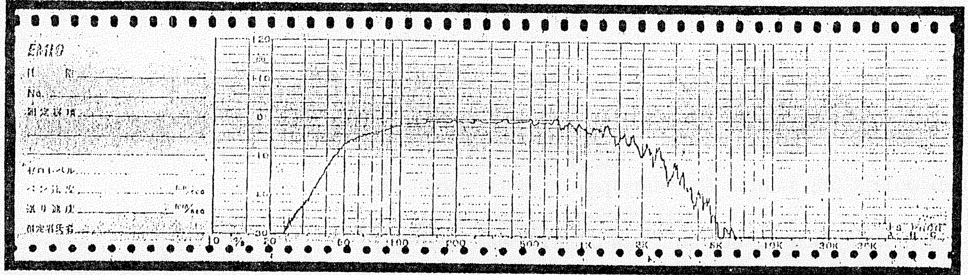


Fig. 53

Make it a rule to clean the heads every time you use your tape recorder. AKAI's Head Cleaning Kit (Accessory No. HC-500) is recommended for removing foreign matter deposited on the heads. If this kit is not available, use alcohol.

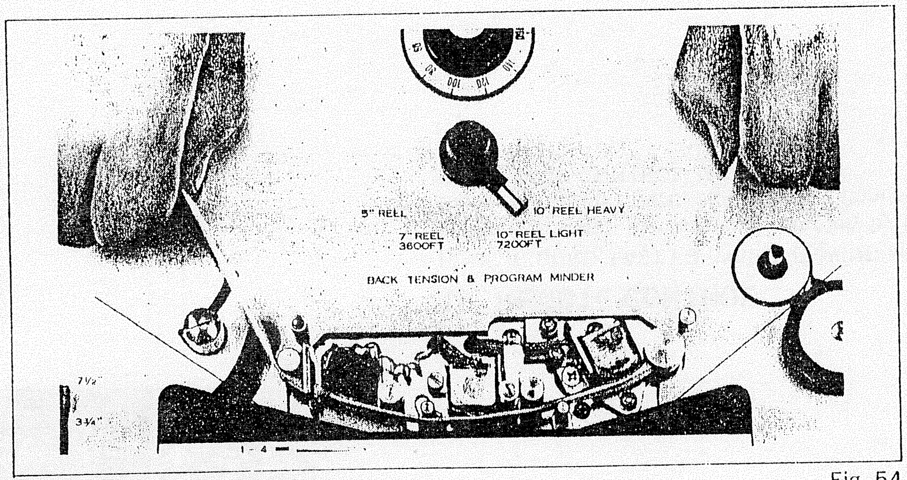

5" REEL
10" REEL HEAVY
7" REEL 3600FT
10" REEL LIGHT 7200FT
BACK TENSION & PROGRAM MINDER
7½"
3¾"
1 - 4

Fig. 54

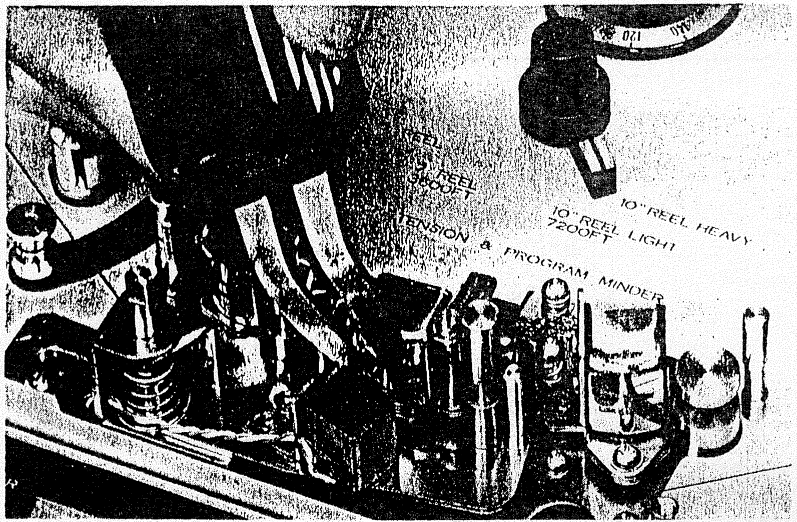


Fig. 55

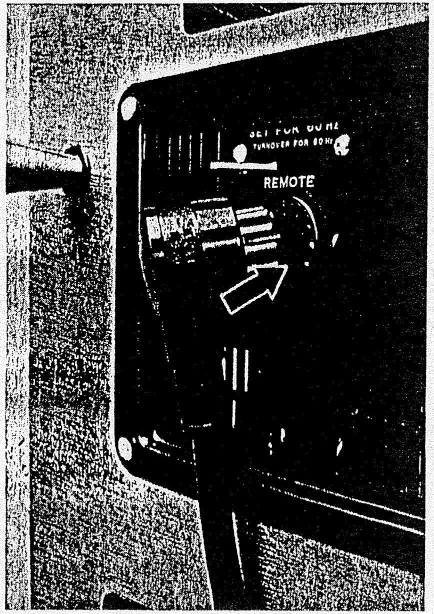


Fig. 56

18. HEAD DEMAGNETIZING

Normally the steel pole pieces which form a part of the recording and playback heads become slightly magnetized. The effect of the slight head magnetization is to partially erase the tape. Mostly high frequencies suffer. Generally, slightly magnetized heads can be detected by noticing loss of normal high frequency response which cannot be corrected through head alignment. Severe magnetization which may result if magnetized tools are used in the vicinity of the heads will result in noise or considerable distortion in addition to the loss of high frequency response. Although the X-330 already has a built-in Head Demagnetizing Circuit, it is recommended that head demagnetization be performed periodically.

Head demagnetization can be accomplished by touching the head lightly with the demagnetizer and making several small circular motions over all head surface areas as well as the head housing.

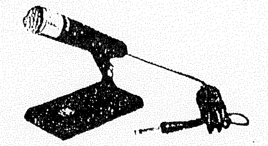
19. REMOTE CONTROL

PLAY, RECORD, FAST FORWARD, REWIND and MANUAL REVERSE operations of the X-330 can be controlled remotely by using the optional accessory, remote control unit (ACC. No. RC-20). Connect the plug of remote control to the REMOTE CONTROL JACK.

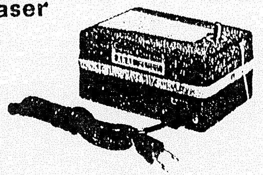
Ⅲ. ACCESSORIES

1. OPTIONAL ACCESSORIES

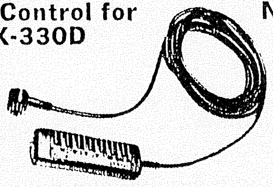
Dynamic Microphone **No. DM-13**



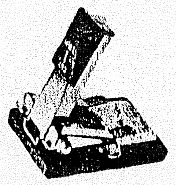
Tape Eraser **No. ATE-7**



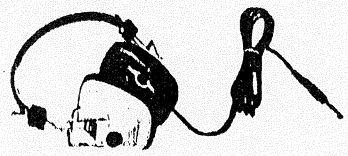
Remote Control for X-330&X-330D **No. RC-20**



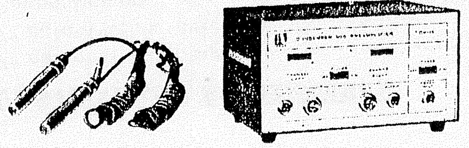
Tape Splicer **No. AS-3**



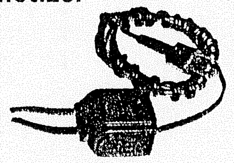
Stereo Headphone **No. ASE-9S**



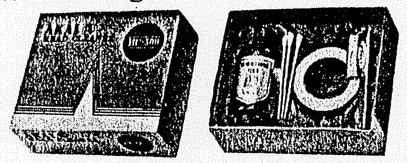
Condenser Microphone **No. CM-15**



Head Demagnetizer **No. AH-6**

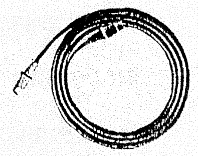


Head Cleaning Kit **No. HC-500**

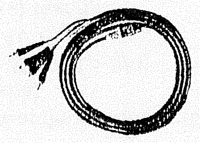


Akai Connecting Cords

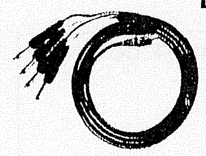
D-100



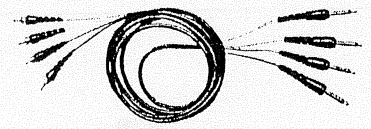
DR-110



DM-120



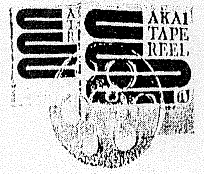
RM-130



Akai Magnetic Tape & Tape Reel

AKAI Magnetic Tape

AT-5S	(600 foot)
AT-7S	(1,200 foot)
AT-10S	(2,400 foot)
AT-5L	(900 foot)
AT-7L	(1,800 foot)
AT-10L	(3,600 foot)



AKAI Tape Reel

ATR-5	(for 5")
ATR-7	(for 7")
ATR-10	(for 10-1/2")

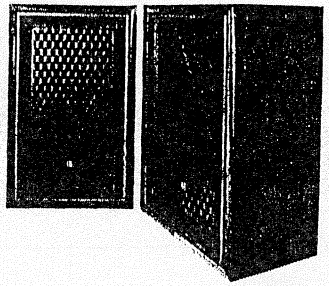
MODEL SW-180

SW-180, the new Akai 3-way·4-speaker system, with high and midrange level controls, is design matched to high fidelity Akai stereo tape recorders . . . . to obtain the best results.

Enjoy perfect reproduction of pure sounds from exciting high notes, to mellow, vibrant low tones.

SPECIFICATIONS

SPEAKERS	: 12″ woofer (L.T.P. edge), 3-1/2″×11-1/2″ midrange, two 2″ horn type tweeters.
MAX. POWER INPUT	: 60 W
VOICE COIL IMPEDANCE	: 8 ohms
FREQUENCY RESPONSE	: 23 to 22,000 Hz
CROSSOVER FREQUENCY	: 700 Hz and 7,000 Hz
NETWORK	: 12 dB per octave
CABINET	: Oil-finished wooden cabinet (Multi-pipe-ducted bass reflex type)
DIMENSIONS	: 30-5/8″×18-3/4″×15-3/4″ (777×475×400 mm)
WEIGHT	: 70.4 lbs (32 kg) (each)



MODEL SW-180

2. STANDARD ACCESSORIES

7″ demonstration tape	1
7″ auto-winding metal reel	1
Connection cord	1
Felt pad	2
Silicon oil	1
Fuse	2
Sensing tape	1
Operator's manual	1